LM COMM MODES 1/20/71 ~~8/8/70~~

COMM BASIC CONFIGURATION	PRIOR TO DOCKING	PREP FOR UN DOCKING	LOS PRO-CEDURE	LM RELAY WITH VHF RNG	CSM RELAY	LUNAR STAY	PLSS/ EVCS WITH TV (EVA)
PANEL 11-ALL COMM CB'S-CLOSED							
PANEL 8 - AUDIO(CDR)							
S-BAND T/R SW - T/R					OFF		
ICS T/R SW - T/R							
RELAY ON SW - RELAY OFF							
MODE SW - ICS/PTT				VOX			VOX
AUDIO CONT SW - NORM							
VHF A SW - T/R						OFF	OFF
VHF B SW - OFF	RCV	RCV	RCV	RCV		RCV	
VOX SENS - MAX							
PANEL 16 - ALL							
ALL COMM CB'S-CLOSED							
CB(16 TV -) OPEN							CLOSED
PANEL 14 - UPLINK SQUELCH SW AS DESIRED	ENABLE	ENABLE	ENABLE	ENABLE	OFF	OFF*	ENABLE
PANEL 12, UPDATA LINK							
SW - OFF							
PANEL 12 - AUDIO (LMP)							
S-BANK T/R SW - T/R				RCV	OFF		
ICS T/R SW - T/R RELAY ON SW - RELAY - OFF				ON			ON
MODE SW - ICS/PTT				VOX			VOX
AUDIO CONT SW - NORM							
VHF A SW - T/R						OFF	
VHF B SW - OFF	RCV	RCV	RCV	RCV		RCV	RCV
VOX SENS -. MAX INCR							
PANEL 12 - COMM							
S-BAND MODULAT SW-PM							FM
S-BANK XMTR/RCVR SW-PRIM							SEC
S-BAND PWR AMPL SW-PRIM							
S-BAND VOICE SW-VOICE			VOICE				
S-BAND PCM SW - PCM							
S-BAND RANGE SW-OFF/RESET		RANGE				AS REQ	
VHF A XMTR SW -VOICE	VOICE/ RNG			VOICE OR VOICE/RNG (IF RNG REQ)		OFF	
VHF A RCVR SW - ON						OFF	
VHF B XMTR SW -OFF		DATA	DATA		DATA	OFF	
VHF B RCVR SW - OFF	ON	ON		ON		ON	ON
SQUELCH VHF A - NORM							N.T.+11/2
SQUELCH VHF B - NORM							N.T.+11/2
TLM BIOMED SW - AS REQ	RIGHT	RIGHT	OFF	OFF			OFF
TLM PCM SW - HI		LO	LO				
RECORDER SW - OFF	AS DES	AS DES	AS DES	AS DES	AS DES	AS DES	ON
PANEL 12 - COMM ANT:							
TRACK MODE SW - AUTO			SLEW			SLEW	OFF
PITCH CONT - COMPUTED ANGLE							
YAW CONT - COMPUTED ANGLE							
S-BAND SEL-SLEW			AFT OR FWD				AS REQ
VHF SEL - AFT OR FWD							EVA
*DURING EVA - ENABLE							

LOSS OF COMM (PDI)

1 Verify Standard Comm Configuration

2 S-BD SIG STR Low (<3.0) - Reacquire
With Steerable

3 STILL NO COMM (SIG STR LOW <3.0)
OMNI - Select Best OMNI

4 STILL NO COMM
S-BD: XMTR/RCVR - SEC
: PWR/AMP - SEC

5 60 SEC, STILL NO COMM
DN VOICE BU (HOT MIKE)
BIOMED - OFF

6 60 SEC, STILL NO COMM
VOICE
FM

7 60 SEC, STILL NO COMM
CSM RELAY

PM
S-BD AUDIO (Both) - OFF
Notify CSM To Config
For Relay

LM COORDINATES	STEERABLE ANTENNA PITCH	YAW
+X	90	-45
-X		
+Y	90	45
-Y		
+Z	0	0
-Z	180	0

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STAGING

ASC BATT (2)-ON(PRECONDITION)
DES BATTS-OFF
MODE CONTROL (BOTH)-ATT HOLD
DEADFACE
✓GUID SW (IF PGNS: DAP 11002, V77)
ATT CONT (3)-MODE CONT
BAL CPL-ON
DEAD BAND - MIN
P47, 404,5,6=0
470R
HELIUM MON-✓ASC PRESS
MASTER ARM-ON
ASC He Sel-BOTH
✓CB ED LOGIC PWR (2)-CLOSED
He PRESS ASC-FIRE
STOP PB-PUSH
-X TRANS 2fps
STAGE-FIRE
+X TRANS 2fps
CB ED LOGIC PWR (2)-OPEN
CABIN REPRESS-CLOSE
DES O2-CLOSE, #1 ASC O2-OPEN
H2O SEL-ASC
DES H2O-CLOSE, ASC-H2O-OPEN
PRESS REG A&B-EGRESS
SUIT GAS DIV-EGRESS
CABIN GAS RETURN - EGRESS
ATT/TRANSL-2 JET
P00
STOP PB-RESET

✓GUID SW

DPS ABORT/APS INSERTION

✓GUID SW
THROTTLE-UP
ABORT PB-PUSH
MODE CONT (BOTH)-AUTO
YAW RT 30°
623+1
29% DES REG-CLOSE
BURN DPS TO DEPLETION
ABORT STAGE PB-PUSH
ENG ARM-ASC
START PB-PUSH
ASC FEED(2)-OPEN↑ (UNLESS
MAIN SOV-CLOSE↓ BUS LOSS)
CABIN REPRESS - CLOSE
DES O2-CLOSE, #1 ASC O2-OPEN
H2O SEL-ASC
DES H2O-CLOSE ASC H2O-OPEN
PRESS REGS A&B-EGRESS
SUIT GAS DIVERTER - EGRESS
CABIN GAS RETURN - EGRESS
PROP TEMP/PRESS-ASC
He MON-ASC
✓XFEED
✓INVERTER
THROTTLE/JET-JETS
CB(11) RR(2) - CLOSED
V16N85 (500R)
500fps MAIN SOV-OPEN↑
ASC FEED(2)-CLOSE↓
200fps ENG ARM-OFF (UNLESS BUS LOSS)
STANDBY TO COPY GET
0fps ABORT STAGE-RESET
STOP PB-PUSH
DET-STOP
GET_____
MODE CONT-ATT HOLD
404,5,6=0 470R

DPS ABORT/INSERTION

✓GUID SW
THROTTLE-UP
ABORT PB-PUSH
MODE CONT(BOTH)-AUTO
YAW RT 30°
623+1
✓INVERTER
V16N85 (500R)
29% DES REG-CLOSE
200fps DES ENG CMD OVRD-OFF
(UNLESS CDR BUS OUT)
TFC-10 DES REG-Close (<86%)
STANDBY TO COPY GET
0fps STOP PB - PUSH
DET - STOP
GET_____
MODE CONT-ATT HOLD
ENG ARM-OFF
ABORT (STAGE)-RESET
STOP PB - RESET
404,5,6=0 470R

APS ABORT/INSERTION

✓GUID SW
ABORT STAGE PB-PUSH
MODE CONT(BOTH)-AUTO
ENG ARM-ASC
START PB-PUSH
ASC FEED(2)-OPEN↑ (UNLESS
MAIN SOV-CLOSE↓ BUS LOSS)
YAW RT 30°
623+1
CABIN REPRESS - CLOSE
DES O2-CLOSE, #1 ASC O2-OPEN
PRESS REGS A&B - EGRESS
SUIT GAS DIV - EGRESS
CABIN GAS RETURN - EGRESS
H2O SEL-ASC
DES H2O-CLOSE, ASC H2O - OPEN
PROP TEMP/PRESS-ASC
He MON-ASC
✓XFEED
✓INVERTERS
THROTTLE/JETS-JETS
V16N85 (500R)
500fps MAIN SOV-OPEN↑
ASC FEED(2)-CLOSE↓
200fps ENG ARM-OFF (UNLESS BUS LOSS)
STANDBY TO COPY GET
0fps ABORT STAGE-RESET
STOP PB-PUSH
DET-STOP
GET_____
MODE CONT-ATT HOLD
404,5,6=0 470R

ABORT RULES

1 ATT & RATE LIMITS
DPS >5° SEC
APS >10° SEC

2 DPS SHUTDOWN
<30 fps - STAGE & RCS
>30 fps - ABORT STAGE

3 APS UNDER BURN

PGNS	AGS
<400 NULL RESIDUALS	AUTO, A/H 15FPS
>400 A/H BURN Ha,Hp,HDOT	

4 INSERTION
WITH VOICE-GROUND RECOMMENDS TRIM SOURCE AT T GO∿1 MIN
TRIM TO <2fps (AGS X AXIS ONLY) AND STANDBY FOR
TWEAK AT INSERTION +4 MINUTES(10° OHW OR 250° FDAI)

5 NO VOICE
AGS & PGNS <10fps TRIM ACTIVE SYSTEM
AGS & PGNS >10fps TRIM SYSTEM THAT AGREES WITH RR

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MISSION RULES NO-GO'S

	PRE PDI	PDI TO PDI +5+30	PDI +5+30 TO HI GATE	HI GATE TO LO GATE	LO GATE TO TD
EPS	ONE DC BUS	ABORT	ABORT	ABORT	ABORT
	ONE DESCENT FEEDER SHORTED	ABORT	ABORT	ABORT	ABORT
	ONE ASCENT FEEDER SHORTED	ABORT	ABORT	ABORT	ABORT
	3 DESCENT BATS	ABORT	ABORT	ABORT	GO
	ONE ASCENT BAT	ABORT	ABORT	GO	GO
	BOTH INVERTERS	ABORT	ABORT	ABORT	GO
	AC BUS A AND B	ABORT	ABORT	ABORT	GO
ED	ONE PYRO SYSTEM ARMED	ABORT	ABORT	ABORT	ABORT
	ONE PYRO SYSTEM	ABORT	ABORT	ABORT	ABORT
ECS	CABIN PRESS <4.4	ABORT	ABORT	ABORT	GO
	SUIT LEAK	ABORT	ABORT	ABORT	ABORT
	BOTH SUIT FANS	ABORT	ABORT	ABORT	GO
	BOTH DEMAND REGS	GO	GO	GO	GO
	BOTH H20 SEPS	GO	GO	GO	GO
	DESCENT 02 TANK	GO	GO	GO	GO
	TWO 02 TANKS	ABORT	ABORT	ABORT	GO
	PRI OR SEC COOLANT LOOP	GO	GO	GO	GO
	PRI AND SEC COOLANT LOOP	ABORT	ABORT	ABORT	GO
	PRI OR SEC H20 FEED	GO	GO	GO	GO
	PRI AND SEC H20 FEED	ABORT	ABORT	ABORT	GO
	DESCENT H20 TANK	GO	GO	GO	GO
	TWO H20 TANKS	ABORT	ABORT	ABORT	GO
G&C	PGNS GUID STEER	ABORT	ABORT	GO	GO
	3 AXIS ATT CONT ACA				
	PGNS RATE CMC & PGNS AUTO	ABORT	ABORT	OPTION	OPTION
	AGS RATE CMD	ABORT	ABORT	OPTION	OPTION
	2 ACA	ABORT	ABORT	ABORT	ABORT
	AUTO +X & AUTO DPS IGNITION	GO	GO	GO	GO
	2 FDAI-ATT/RATE/ERR	OPTION	OPTION	OPTION	OPTION
	LR	ABORT	ABORT	GO	GO
	RED APS ON	ABORT	GO	GO	GO
	P & R GDA TRIM (IMPING CONST VIOL)	ABORT	ABORT	ABORT	ABORT
	MANUAL THROTTLE (2 TTCA) & AUTO THROT	ABORT	ABORT	ABORT	ABORT
DPS	PROP LEAK (ΔQ FU/OX>13%)	ABORT	ABORT	ABORT	ABORT
	FU OR OX INLET/ULLAGE>65%<160	ABORT	ABORT	ABORT	ABORT
	LO LEVEL <2%			ABORT	ABORT
APS	PROP LEAK	ABORT	ABORT	ABORT	ABORT
	FU/OX INLET PRESS<62,>220	ABORT	ABORT	ABORT	ABORT
	APS HE 1 OR 2 DECREASING	ABORT	ABORT	ABORT	ABORT
RCS	HE/PROP LEAK				
	HE/PROP LEAK (BETWEEN MAIN & ISO VLV)	ABORT	ABORT	GO	GO
	FU/OX MNFLD A OR B PRESS<100	ABORT	ABORT	ABORT	ABORT
	PAIR ISOLATED	GO	GO	GO	GO
	3 AXIS ATT CONT RED	GO	GO	GO	GO
	3 AXIS ATT CONT	ABORT	ABORT	ABORT	ABORT

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ALARM CODES (PDI)

CODES	DEFINITION	ACTION
00214	PROG USING IMU WHEN TURNED OFF	GUID CONT - AGS
00402 (4 TIMES)	FIND CDUW ROUTINE NOT CONTROLLING ATTITUDE	GUID CONT - AGS
00511	NEITHER OR BOTH LR ANT POSITION DISCRETES PRESENT	LR ANT - HOVER, CONSULT MSFN
01107	PHASE TABLE FAILURE	GUID CONT-AGS (LAND MANUALLY IF DESIRED)
RECURRING 01406	BAD RETURN FROM ROOTPSRS	NO GUIDANCE, SWITCH TO P66 OR SWITCH TO AGS
RECURRING 01410	UNINTENTIONAL OVERFLOW IN GUIDANCE	NO GUIDANCE, SWITCH TO P66 OR SWITCH TO AGS
01412	DESCENT IGN ALGORITHM NOT CONVERGING	PRIOR TO BURN-SUSPECT BAD UPLINK SV OR RLS, HAVE MSFN SEND NEW UPLINK
01466	INSUFFICIENT THROTTLE SERVICING	GUID CONT - AGS, FLY PGNS ATTITUDE ERROR NEEDLES
01703	INTEGRATION CANNOT BE COMPLETED IN TIME FOR BURN	IF LARGE IGNITION DELAY-DO NOT BURN PDI IF SMALL IGNITION DELAY-MANUALLY THROTTLE UP AT DET N+26
2XXXX	ALL POODO'S (EXCEPT 21406)	GUID CONT - AGS
21406	BAD RETURN FROM ROOTPSRS	SUSPECT BAD UPLINK SV OR RLS, HAVE MSFN SEND NEW UPLINK
RECURRING 3XXXX	ALL SOFTWARE RESTARTS (BAILOUT)	CONTINUE-INSURE NO UNSAFE CONDITION DEVELOPS. IF IT DOES SWITCH TO AGS TO REDUCE LGC DUTY CYCLE AND FLY PGNS ATTITUDE ERROR NEEDLES
N49	RMAX VMAX >.3nm, 2.0fps	1. IF STEADY STATE-RESET 2. REJECT FIRST MARK THEN ACCEPT NEXT COUPLE OF MARKS AND MONITOR FOR NEXT CONVERGENCE >2.0nm OR 12.0fps PRIOR TO CSI OR >.8nm OR 5.0fps AFTER CSI CONSIDERED EXCESSIVE
F97N63	LGC THINKS ENG FAILED	PRO TO SET ΔV MON. DO NOT ENTER BECAUSE IT WILL SLIP TIG IF RECURRING, NO GUIDANCE

NO PDI+12 APS ABORT

ASSUMPTIONS:

PDI CHECKLIST COMPLETE TO TIG.
DPS INOPERATIVE.

V37E 30E, LOAD NO PDI+12 PAD
V37E 42E
01706 ALARM, PRO
N86
410+5, LOAD ΔV
267 R
411+1
407+0

N18 R, P, Y (0, 270, 0)

SET DET

He MON - ASC PRESS
MASTER ARM - ON
ASC He SEL - BOTH
CB(11)&(16)
✓ED LOGIC PWR(2)-CLOSED
He PRESS ASC - FIRE

DES O2 - CLOSE
#1 ASC O2 - OPEN
H2O SEL - ASC
DES H2O - CLOSE
ASC H2O - OPEN

V48, 11002

CHECK APS BURN

APS BURN

CB(16)
DISP/ENG OVRD/LOGIC - CLOSED
CB(11)&(16)
STAB/CONT (ALL) - CLOSED
EXCEPT
CB(11) AEA AND DECA PWR AND
CB(16) DES ENG OVRD - OPEN
CB(16) EPS:
CROSS TIE BAL LOADS - OPEN
RATE SCALE - 25°/SEC
ATT/TRANSL - 4 JETS
BAL CPL - ON
DEAD BAND - MIN
ABORT/ABORT STAGE - RESET
ATT CONT(3) - MODE CONT
MODE CONT - ASCENT - PGNS - AUTO
AGS - AUTO
STOP PB (2) - RESET
TTCA (2) - JETS
411+1
-2:00 400+1
AGS/PGNS
-1:00 MASTER ARM - ON

RCS STAGE
-:14 MANUAL ULLAGE
-:10 STAGE-FIRE

-:10 ABORT STAGE PB - PUSH(T=0 FOR AGS)
ENG ARM - ASC

-:05 PRO

:00 ENG ON
+:01 ENG START - PUSH
200 fps ENG ARM - OFF
0 fps ABORT STAGE - RESET
STOP PB - PUSH

DPS BURN

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CB(11) DECA GMBL AC - CLOSED
CB(16) DISP/ENG OVRD/LOGIC - CLOSED
CB(11)&(16) STAB/CONT CB'S(ALL) - CLOSED
EXCEPT CB(11) AEA - OPEN

RATE SCALE [PDI] - 25°/SEC

THR CONT - MAN/CDR
- [PDI] AUTO/CDR

ATT/TRANSL - 4 JETS
BAL CPL - ON
ENG GMBL - ENABLE
DES ENG CMD OVRD - OFF
ABORT/ABORT STAGE - RESET
DEADBAND - MIN
ATT CONT(3) - MODE CONT

MODE CONT [PDI] PGNS - AUTO
AGS - AUTO
STOP PB (2) - RESET
TTCA (2) - THROT/Min [PDI] LMP TTCA-SOFT STOP

[FOR PDI GO TO TIMELINE BOOK]

-2:00 400+1

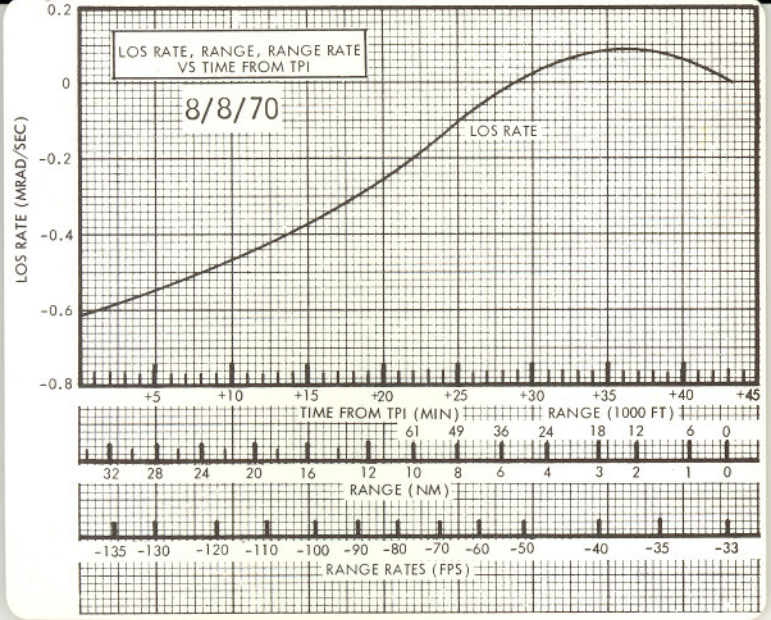
-1:00 MASTER ARM - ON (1st BURN)

- :30 ENG ARM - DES

FOR AGS BURN ABORT PB - PUSH (T=0 FOR AGS)

-:07.5 ULLAGE (MANUAL FOR AGS)
- :05 PRO

+ :01 DES REG (2)-OPEN (>29%)
TFC-10 DES REG (2) - CLOSE (<86%)
ΔV=0 STOP PB - PUSH
ENG ARM - OFF
ABORT PB - RESET



LPD CHANGES

ALT	UP	DN	X
6	725	775	800
5	650	700	675
4	550	575	550
3	425	450	400
2	275	300	275
1	100	115	125
0.5	35	40	50

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RR RANGE VS AGC VOLTS

RANGE	VOLTS
400 nm	1.6
200 nm	2.0
100 nm	2.2
50 nm	2.5
25 nm	2.7
12.5 nm	2.8

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CDR BUS LOST	LMP BUS LOST 12/21/70
AGS	INV 1
INV 2	SUIT FAN 1
SUIT FAN 2	LMP AUDIO CONT - BU
CDR AUDIO CONT-BU	S-BD SEC/SEC/DN VOICE BU/BIOMED-OFF
ACTIVATE SEC GLY LOOP	S-BD ANT - OMNI
SEE EPS 1, BLOCK 17	SEE EPS 1, BLOCK 28

DEDA ADDRESSES

R DOT - 440
R - 317
Ha - 315
Hp - 403
VI - 433
H DOT - 367
H - 337
- 277
ΔV 404, 5,6=0 470,71,72R

Y DOT - (Present)(-)270
- (Next Man)(-)263
STORE ∫ -415 & 1E
STORE R DOT -503E
STORE R -316E
V16N78 RR RNG/RNG RT
V16N92 %THROT/HDOT/H
V21N69 ΔRLS

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S-BAND
ANTENNA ANGLES
DESCENT REFSMMAT

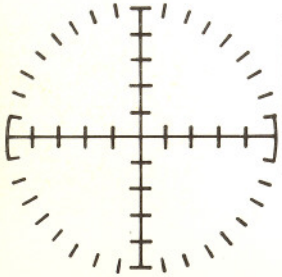
11/10/70

YAW=0° ANTENNA		IGA (PITCH)	YAW=180° ANTENNA	
P	Y		P	Y
121	-38	0	57	-43
108	-41	10	70	-46
95	-42	20	84	-48
82	-42	30	99	-47
69	-40	40	113	-45
57	-37	50	126	-42
46	-32	60	138	-37
36	-27	70	148	-32
27	-21	80	157	-25
19	-15	90	165	-19
12	-8	100	172	-12
5	-1	110	179	-5
-2	6	120	186	2
-10	13	130	194	9
-17	20	140	201	16
-25	27	150	209	23
-35	33	160	218	28
-45	38	170	228	34
-57	43	180	239	38
-70	46	190	252	41
276	48	200	265	42
261	47	210	278	42
247	45	220	-69	40
234	42	230	-57	37
222	37	240	-46	32
212	32	250	-36	27
203	25	260	-27	21
195	19	270	-19	15
188	12	280	-12	8
181	5	290	-5	1
174	-2	300	2	-6
167	-9	310	10	-13
159	-16	320	17	-20
151	-23	330	25	-27
142	-28	340	35	-33
132	-34	350	45	-38

ft		nm
500	=	0.08
1000	=	0.16
1500	=	0.25
2000	=	0.33
2500	=	0.41
3000	=	0.49
3500	=	0.57
4000	=	0.66
4500	=	0.74
5000	=	0.82
5500	=	0.90
6000	=	0.99
6500	=	1.07
7000	=	1.15
7500	=	1.23
8000	=	1.32
8500	=	1.40
9000	=	1.48
9500	=	1.56

8/8/70

COAS BORESIGHT LOG



DAP DATA LOAD

A 1=STAGED	2=UNSTAGED	3=DOCKED
B 0=RCS A	1=RCS B	2 OR 3=RCS A&B
C 0=FINE	1=NORM	
D 0=0.3°	1=1.0°	2 & 3=5.0°
E 0=0.2°/SEC	1=0.5/SEC	2=2.0°/SEC
		3=10.0°/SEC

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DPS	APS	RCS
TEMP/PRESS MON	TEMP PRESS MON	He >1400 PSI
>30 PSI @ PDI	>78 PSI OX	PRPLNT
HELIUM NOM	>114 PSI FU	PRESS >100 PSI
>1000<1150	50 - 90°F	TEMP 40 - 100°F
PSI PRE PDI	ΔT<60°F FOR	FUEL/OXID MANF
	BT<100 SEC	PRESS >100 PSI
	HELIUM NOM	ΔP <80 PSI
	PRESS 3125 PSI	QUAD TEMP >119°F
		(25 MIN TO FIRING)

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PDI +→LV	DPS/APS				APS			
	FDAI		OHW		FDAI		OHW	
	ABORT + 0:20				ABORT + 0:20			
	→300°		→37°		→300°		→37°	
	T1 →270°	T2 SHDN	T1 →α2	T2 SHDN	T1 →270°	T2 SHDN	T1 →α2	T2 SHDN
0:30	NA	2:00	NA	2:00	NA	1:55	NA	2:00
1:00	NA	2:40	NA	2:40	NA	2:35	NA	2:40
1:30	NA	3:20	NA	3:25	NA	3:15	NA	3:25
2:00	2:40	4:15	2:40(0°)	4:20	2:40	4:20	2:30(1°)	4:10
2:30	3:15	5:05	3:15(4°)	5:05	3:20	5:15	3:10(5°)	5:10
3:00	3:50	5:55	3:50(7°)	5:55	4:00	6:10	3:55(7°)	6:10
3:30	4:30	6:45	4:25(8°)	6:40	4:40	7:00	4:40(8°)	7:05
4:00	5:10	7:35	5:05(9°)	7:35	5:35	8:05	5:30(9°)	8:05
4:30	5:50	8:15	5:45(9°)	8:15	6:30	9:05	6:25(9°)	9:00
5:00	6:30	9:00	6:25(9°)	9:00	7:20	10:00	7:25(9°)	10:00

PDI + →LV	DPS/APS (CONT)				APS (CONT)			
	FDAI		OHW		FDAI		OHW	
	ABORT + 0:20				ABORT + 0:20			
	→300°		→37°		→300°		→37°	
	T1 →270°	T2 SHDN	T1 →α2	T2 SHDN	T1 →270°	T2 SHDN	T1 →α2	T2 SHDN
5:30	7:10	9:55	7:10(9°)	9:40	8:20	11:05	8:25(8°)	11:00
6:00	7:40	11:00	7:35(10°)	11:05	9:10	12:00	9:20(8°)	11:55
6:30	8:10	12:10	8:05(12°)	12:10	10:05	13:00	10:15(7°)	12:50
7:00	8:45	13:05	8:35(13°)	13:05	10:50	13:40	11:05(7°)	13:40
7:30	9:20	14:00	9:10(14°)	14:00	11:35	14:25	11:50(7°)	14:25
8:00	10:00	14:55	9:40(15°)	14:50	12:15	15:15	12:25(7°)	15:10
8:30	10:35	15:45	10:05(17°)	15:35	12:45	16:00	13:00(8°)	15:55
9:00	11:10	16:20	10:25(17°)	16:35	13:00	16:35	13:20(11°)	16:35
9:30	11:45	16:55	10:50(18°)	17:05	13:20	17:10	13:35(12°)	17:10
10:00	12:20	17:30	11:25(18°)	17:45	13:40	17:40	13:55(13°)	17:40

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CABIN PREP-Perform EVA 1 Or 2 As Reqd

EQPT PREP-Perform EVA 1 Or 2 As Reqd

PLSS DONNING-Perform EVA 1 or 2 As Reqd

Position Post EVA 1 or 2 Cue Card
For Post EVA

NON EVA CREWMAN-Connected To LM O2, Comm, & H2O
Gas Connector Plugs In PGA
PGA Diverter Vlvs - Horizontal

EVA CREWMAN: PGA Diverter Vlvs - Vertical
For EVA 1 (MIN TIME) - CSRC In PGA Pocket

PLSS COMM CHECK

Verify Powerdown CB Configuration
Verify LM EVA Antenna Deployed
COMM: MODULATE-FM
CB(16) COMM: TV-Close
Verify Voice Comm With Hou

Audio (Non EVA Crewman)
S-BAND - T/R
ICS - T/R
RELAY - OFF
MODE - VOX (VOX SENS MAX)
VHF A - RCV
VHF B - T/R

Audio (EVA Crewman)
S-BAND - T/R
ICS - T/R
RELAY - ON
MODE - VOX (VOX SENS MAX)
VHF A - RCV
VHF B - T/R

ONE MAN EVA

COMM:
VHF-OFF, ON, VOICE, ON, NON EVA
CREWMAN POSITION, HI
SQUELCH A & B - Noise Thres + 1-1/2
RECORDER - ON
VHF Antenna - EVA

EVA Crewman Connect to PLSS Comm (Audio CB Open/Close)

RCU PTT - MAIN (Rt)

PLSS Mode-B, Blade-CCW (Tone-On,Vent Flag-P, Press Flag-O, O2 Mom)

PLSS O2 Press Gage >85%
Perform Comm Check With CDR

NOTE: Unstow PLSS Antenna If It Transmits Garbled And/Or Loses TM.

Audio (CDR & LMP)
VHF A - T/R
VHF B - RCV

COMM:
VHF A XMTR - VOICE
VHF B XMTR - OFF

PLSS Mode - A, Wheel-CCW (Tone-On)
Perform Comm Check With Each Other & Comm & TM Check With Hou

Read PLSS O2 Qty To Hou

NOTE: IF Comm Is NO GO With Hou
S-BD MOD - PM
Verify Comm & TM

CB(16) COMM: TV - Open (EVA 1)

FINAL SYSTEMS PREP

CB(16) ECS: CABIN REPRESS - Close (Ver)
SUIT FLOW CONT- Open

SUIT GAS DIVERTER - PULL-EGRESS
CABIN GAS RETURN - EGRESS
SUIT CIRCUIT RELIEF - AUTO (Verify)

OPS CONNECT

Unstow OPS O2 Actuator
Connect Actuator To RCU
SUIT ISOL - SUIT DISC
Discon LM O2 Hoses, Secure About PGA

Connect OPS O2 Hose To PGA B/B
Retrieve Purge Valve (Purse) - Verify Closed, Locked & LO
Install Purge Valve In PGA R/R

FOR EVA 2:
Verify Items Prepared For Jettison -
ECS LiOH Cartridge & Brkt
Hammocks
PLSS Batteries & LiOH Carts
Food Waste, Urine Bags
Feedwater Bags & Scale

Drink
DES H2O VLV - CLOSE

HELMET/GLOVE DONNING

Position Mikes (Both)
PLSS FAN - ON, Rt (Vent Flag - Clear)
Don Helmets, Check Drink Bag Position
Don LEVA

EVA Crewman:
LCG - COLD, As Reqd
Disconnect LM H2O Hose
Connect PLSS H2O Hose
Stow LM Hoses

Verify EVA Crewman in CDR's Station

Verify The Following:
- Helmet & Visor (2) - Aligned & Adjusted
- Torso Tiedown (2) - Adjusted
- O2 Connectors (7) - Locked
- Purge Valve (1) - Locked
- H2O Connectors (2) - Locked
- Comm Connectors (2) - Locked

Verify No Fog RH Window
If BSLSS Not Reqd, Stow In Jett Bag
Tie Jett Bag & Transfer To Eng Cover

Don EV Gloves & Verify:
- Wrist Locks (4) - Locked
- Glove Straps (4) - Adjusted

NOTE: If PGA Biting, PLSS O2 - ON/OFF

PLSS DIVERTER - MIN (Verify)
PLSS PUMP - ON

PRESSURE INTEGRITY CHECK

(Non EVA Crewman)

NOTE: LM Suit Circuit Shall Not Be Maintained At Elevated Press >5 min

SUIT GAS DIVERTER - PULL-EGRESS(Verify)
CABIN GAS RETURN - EGRESS (Verify)
SUIT CIRCUIT RELIEF - CLOSE

PRESS REG A - EGRESS
PRESS REG B - DIRECT O2
Monitor Cuff Gage To 3.7 - 4.0 Psig
Then PRESS REG B - EGRESS (Cuff Gage Decay <.3 Psig In 1 min)

SUIT CIRCUIT RELIEF - AUTO (Suit Ckt Press Decays To 4.8 Psia)

PLSS/OPS/PGA (EVA Crewman)

PLSS O2 - ON (Tone-On, O2 Flag-O)
Press Flag Clear (3.1-3.4 Psid)
Cuff Gage 3.7-4.0 Psig
O2 Flag Clear

PLSS O2 - OFF (Cuff Gage Decay <.3 Psig In 1 Min)
PLSS O2 - ON (Cuff Gage 3.7-4.0 Psig, Tone & O2 Flag May Come On)

CABIN DEPRESS

Confirm Go For Depress From Hou
CB(16)ECS: CABIN REPRESS - Open
CABIN REPRESS VLV - Close

Ovhd Or Fwd Dump Valve - OPEN Then AUTO At 3.5 Psia (Verify EVA Crewman Cuff Gage Does Not Drop Below 4.8 Psig)
Verify:
- Cabin At 3.5 Psia
- LM Suit Circuit 3.6 to 4.3 Psia & Decaying
- PLSS/OPS/PGA > 4.8 Psig & Decaying

Start Wrist Watch :00

Ovhd Or Fwd Dump Valve - OPEN
Verify:
- Tone-On & H2O Flag - A (1.3-1.6 Psia)
- LM Suit Circuit 3.6 To 4.3 Psia & Decaying

PLSS/OPS/PGA > 4.8 Psig & Decaying

Partially Open Fwd hatch

FINAL PREP FOR EGRESS :03

PLSS FEEDWATER - OPEN (H2O Flag - Clear In About 4 Min)

Fwd Hatch - Open

Rest Until Cooling Sufficient
Verify:
- PLSS/OPS/PGA 3.7 To 4.8 Psig
- CWEA Status:
  - Caution
  - PREAMPS

CB(16) COMM: TV - Close

Release PLSS Antenna
Lower EV Visor :10

POST ONE-MAN EVA

Perform POST EVA 1 or 2 As Applicable

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LIGHT	MEANING	IMMEDIATED ACTION (POSSIBLE OPERATIONAL IMPLICATIONS)	
STAGE SEQ RELAY LT. OFF AT PDI	Possible Relay Fail	AT PDI: MASTER ARM - OFF, Open LOGIC PWR CB On System Which Had SEQ LT - ON, MASTER ARM - ON. At Ignition Monitor DPS SHe And FUEL/OXID PRESS. SHe Tank Inoperative: STOP PB - PUSH, ENG ARM - OFF. SHe Tank OK: MASTER ARM - OFF, LOGIC PWR CB - CLOSE	(M71)
DES REG	220 psi>He Press>260psi	DES He REG 1 - CLOSE, DES He REG 2 - OPEN Monitor TEMP/PRESS, Maintain FUEL & OXID>160psi	(M31)
ASC PRESS	Either He Press<2775psi (Before Staging)	IF APS NOT PRESSURIZED - CONSULT MSFN, GO TO MAL PROC APS-1 IF APS PRESSURIZED - CLOSE ASC He REG 1 & 2: MONITOR ASC He PRESS; IF BOTH <2775 AND DECREASING - IMMEDIATE LIFTOFF MONITOR FUEL/OXID PRESS; IF EITHER DECREASING - IMMEDIATE LIFTOFF	(M37)
ASC HI REG	Manf Press>220psi	ASC He REG 1 & 2 CLOSE, When <220psi, Open Each REG Separately.	(M38)
ASC QTY	<10 Sec Burn Time	MAIN SOV (2) - OPEN, ASC FEED 2 (2) - CLOSE	(M38)
RCS A REG RCS B REG	165psi>Reg Press>218psi	Monitor MANF PRESS, When <100psi: Bad System MAIN SOV - CLOSE, CRSFD - OPEN	(M42)
RCS	A OR B He Press<1770	Monitor He PRESS & RCS QUANTITY. Affected Sys: QUAD ISOL (4) - CLOSE, MAIN SOV - CLOSE. Monitor MANF PRESS. (Translation May Be Lost In One Or More Axis With A Single System Out.)	(M41)
RCS TCA	One Or More Thrusters Fail Off,Collinear Thrusters Firing Simultaneously	If Stable, Recycle CWEA. If Unstable: Affected QUAD ISOL - CLOSE, Monitor MANF PRESS. Between Ullage And Throttle-up Wait 2 Sec, Affected QUAD ISOL - CLOSE	(M42)
ENG GMBL	GMBL Cmd/Response Discrepancy	ENGN GMBL - OFF. If Lt Still ON: ENG GMBL - ENABLE (CWEA FAIL)	(M25)
LGC	LGC Power, Scaler, or Counter Fail	GUID CONT - AGS. Poss No Auto Eng Shutdown. If RESTART Lt ON, LGC Fail. CB(11)AEA - CLOSE	(M10)
ISS	IMU, ICDU or PIPA (Trusting) FAIL	GUID CONT - AGS. Pos No Auto Eng Shutdown. IF PROG Lt NOT ON, CWEA Fail. CB(11) AEA - CLOSE	(M9)
CES AC	ATCA AC Out of Tolerance	GUID CONT - PGNS, GYRO TEST - POS RT. If Light Stays ON, CWEA Fail. Poss Loss of AGS Control, FDAI Rate Needles Unreliable,RR Usable In LGD Mode Only.	(M27)
CES DC	ATCA DC Out of Tolerance	GUID CONT - PGNS, GYRO TEST - POS RT. If Lt Stays ON, CWEA Fail, If Lt OFF - Cycle CWEA CB, If Lt Stays OFF, Cycle DECA GMBL AC CB To Unlock Throttle. If Lt Reapears: Poss GDA Lock-up, DPS To 100%, No AGS Attitude Control	(M27)
AGS	AGS Power Supply Out of Tolerance,AGS Heater Failed ON,AGS Self Test Failed	GUID CONT - PGNS. If PGNS Unavailable: MODE CONT (AGS) - ATT HOLD, AGS RATE CMD OK, But NO ATT HOLD (Free Drift). 412R, Self Test.	(M17)

ABNORMAL VEHICLE DYNAMICS

Use ACA Hardover to Stabilize Vehicle
If RCS TCA LT ON-Affected QUAD-CLOSE
GUID CONT-AGS, MODE CONT-ATT HOLD, ATT CONT(3)-MODE CONT, V77E
If Not Stabilized-CB(11) STAB/CONT:ATT DIR CONT-OPEN
If Not Stabilized-TTCA/TRANSL(2)-DISABLE, DEADBAND-MAX
If Not Stabilized-ACA PROP(2)-DISABLE

RAPID IMU REALIGN

1) AGS INERTIAL FDAI TO 0°, 0°, 0°
2) V41 N20E, E, E, E,
3) V40 N20 0°, 0°, 0° ON AGS FDAI, ENTR
   WAIT 15 SEC.
4) P51E, PRO, POOE
5) V25N07E, 77E, 10000E, 1E
6) PERFORM P52, OPTION 3 (AUTO OPTICS ARE GOOD)
   NOTE: FOR TEMPORARY LOSS OF CDR'S BUS, UPDATE LGC CLOCK WITH V55 TO COMPLETE RECOVERY.

LIGHT	MEANING	IMMEDIATE ACTION (POSSIBLE OPERATIONAL IMPLICATIONS)
DC BUS BATTERY FEEDER FAULT COMPONENT ~7 W&C LTS	CDR BUS FAILURE	(DPS GOES TO 100%) GUIDE CONT - AGS, SUIT FAN - 2, CDR AUDIO CONT - BU, INV 2, Activate Sec Glycol Loop TO START DPS: DES ENG CMD OVRD - ON TO STOP DPS: DES ENG CMD OVRD - OFF, ENG STOP - PUSH, ENG ARM - OFF TO START APS: AGS Auto ON UNSTAGED (M45) TO STOP APS: AGS Auto OFF, ABORT STAGE - Reset STAGED (M47)
DC BUS BATTERY FEEDER FAULT COMPONENT ~7 W&C LTS	LMP BUS FAILURE	(DPS GOES TO 100% And GDA LOCKED) GUID CONT - PGNS, SUIT FAN - 1, LMP AUDIO CONT - BU, INV - 1 TO START APS/DPS: ENG START - PUSH UNSTAGED (M45) TO STOP APS/DPS: ENG STOP - PUSH STAGED (M47)
BATTERY	BATT OVERTEMP REV CURRENT >10A OVERCURRENT	UNSTAGED: Check All BATS VOLTS, AMPS & TB'S If VOLTS, AMPS OK: Faulty BAT - OFF Then ON If VOLTS, AMPS NOT OK: Faulty BAT - OFF, CB (11&16) CROSS TIE BAL LOADS - CLOSE (M48) STAGED: Check BAT 5, 6 VOLTS, AMPS & TB'S If VOLTS, AMPS NOT OK: CB (11&16) CROSS TIE BUS - CLOSE Faulty BAT: NORMAL FEED - OFF, Good BAT: BACKUP FEED - ON (M48)
INVERTER	AC VOLTS <112 398>FREQ>402	Check AC VOLTS & FREQ. Switch to INV - 2. Bus A&B BUS TIE INV 1 (2) - OPEN (INV 1 Feeder Short). BUS B: BUS TIE INV 2 - OPEN (BUS B Short) BUS A&B: BUS TIE INV 1 (2) - CLOSE. Select INV 1. BUS A: BUS TIE INV 2 - OPEN (INV 2 Feeder Short). BUS A: BUS TIE INV 1 - OPEN (BUS A Short, Lt Stays ON; Close BUS B: BUS TIE INV 2 Before Selecting INV 2). (M49)
ED RELAY	ED Relays K1 To K6 CLOSE With MASTER ARM - OFF	BEFORE PDI: Do NOT Set MASTER ARM-ON, STAGE RELAY - RESET, Appropriate LOGIC POWER CB - OPEN AFTER PDI: Do NOT Set MASTER ARM - ON, STAGE RELAY - RESET If STAGE SEQ RELAYS LT Still ON: ASC He PRESS - FIRE, Monitor ASC Fuel/Oxid Press. If APS Pressurizes, ABORT (M71)

PLSS COMM CHECK :18

Verify Powerdown CB Configuration
COMM: MODULATE - FM
CB(16) COMM: TV - Close
Verify Voice Comm With Hou

Audio (CDR)
- S-BAND - T/R
- ICS - T/R
- RELAY - OFF
- MODE - VOX (VOX SENS MAX)
- VHF A - T/R
- VHF B - RCV

Audio (LMP)
- S-BAND - T/R
- ICS - T/R
- RELAY - ON
- MODE - VOX (VOX SENS MAX)
- VHF A - T/R
- VHF B - RCV

COMM:
S-BD XMTR/RCVR-SEC
VHF - VOICE, ON, OFF, ON, OFF, HI
RANGE - RANGE
SQUELCH A & B - Noise Thres + 1-1/2
RECORDER - ON
VHF Antenna - EVA
UPLINK SQUELCH - ENABLE

LMP Connect To PLSS Comm (Audio CB Open/Close)

PLSS PTT (LMP) - MAIN (Rt)
PLSS Mode(LMP) - A, Wheel-CCW (Tone-On, Vent Flag- P, Press Flag- O, O2 Mom)
PLSS O2 Press Gage > 85%
Perform Comm Check With CDR

NOTE: Unstow PLSS Antenna If It Transmits Garbled And/Or Loses TM

CDR Connect To PLSS Comm (Audio CB Open/Close)

Audio (CDR)
- VHF A - OFF
- VHF B - OFF

PLSS PTT (CDR) - MAIN (Rt)

NOTE: No MSFN Reception In PLSS Mode B

PLSS Mode(CDR) - B, Blade-CCW (Tone-On, Vent Flag- P, Press Flag- O, O2 Mom)
PLSS O2 Press Gage > 85%
Perform Comm Check With LMP

PLSS Mode (LMP)- B, Blade-CCW (Tone-On)
PLSS Mode (CDR)- A, Wheel-CCW (Tone-On)
Verify Voice Comm With Each Other

PLSS Mode (Both) - AR (Tone-On)

NOTE: (AR) Wheel-Hou, Blade-EVA

Perform Comm & TM Check With Hou & Comm Check With Each Other
Read PLSS O2 Qty to Hou

NOTE: If Comm Is NO GO With Hou
S-BD MOD - PM
Verify Comm & TM

CB(16) COMM: TV - Open

FINAL SYSTEMS PREP :28

CB(16) ECS: CABIN REPRESS - Close (Ver)
- SUIT FAN ΔP - Open
- SUIT FAN 2 - Open

SUIT FAN Sel - 2
Verify ECS Caution & H2O SEP COMP Lts - On (~ 1 Min)

SUIT GAS DIVERTER - PULL-EGRESS
CABIN GAS RETURN - EGRESS
SUIT CIRCUIT RELIEF - AUTO (Verify)

OPS CONNECT :29

LMP 1st - Unstow OPS O2 Actuator
Connect Actuator To RCU
SUIT ISOL - SUIT DISC
Discon LM O2 Hoses, Secure About PGA

Connect OPS O2 Hose To PGA B/B
Retrieve Purge Valve (Purse)- Verify Closed, Locked & LO
Install Purge Valve In PGA R/R
PGA Diverter Valves - Vertical

CDR Repeat OPS CONNECT

Drink
DES H2O VLV - CLOSE

HELMET/GLOVE DONNING :38

Position Mikes (Both)
PLSS FAN - ON, Rt (Vent Flag - Clear)
Don Helmets, Check Drink Bag Position
Don LEVA's

LCG - Cold, As Reqd
CB(16) ECS: LCG PUMP - Open
Disconnect LM H2O Hose
Connect PLSS H2O Hose
Stow LM Hoses (CDR's To ECS Handhold)

Verify The Following:

Helmet & Visor	(2)	- Aligned & Adjusted
Torso Tiedown	(2)	- Adjusted
O2 Connectors	(6)	- Locked
Purge Valves	(2)	- Locked
H2O Connectors	(2)	- Locked
Comm Connectors	(2)	- Locked

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EQUIPMENT PREP EVA 1

DET-Set/Up :15
Unstow BSLSS, Remove From Bag
Stow BSLSS RH Fwd Cabin
Stow BSLSS Bag In Jett Bag (LHSSC)
Stow RCU Brkt Bag (Purse) In Jett Bag
Stow Jett Bag On LH Fwd Floor

Unstow PLSS On Floor, Set Against Hatch
Stow COAS In FWD Window Mount
Secure Util Lts Back Of AOT
Verify O2 EVA Stowage Straps Accessible

Empty UCTA's
Check PGA Zippers, Verify Lock-Lock
Fill Drink Bags(Back ISA)-Evac, Install

Stow PGA Gas Conn Plugs In Purse
Empty PGA Pockets Into Purse
Verify Watch On PGA

Unstow CSRC (LHSSC), Remove Bag, Stow
In LMP Pkt
Unstow Sur Seq Cam (LHSSC) Install Lens
Stow Sur Seq Camr Bag In Jett Bag
Install Mag CC (Purse)
Connect Power Cable, Ver Ops

Settings 2.8/60, TIME FR (2 Places)
Stow Sur Seq Cam In LHSSC,
Handle Aft, Lens Outboard
Unsnap LEC Compt (Aft LHSSC)

Stow LEVA Bags On Floor, 1 Left, 1 Rt
Position Helmets On Armrests

CDR Move To Aft Cabin Area
Deploy LM EVA Antenna
Unstow B&W TV, Stow On Mid-Step
Unstow RCU's, Resnap Flaps
Stow RCU's On Data File

EVA 1 PREP & POST

Unstow CDR Boots, Purge Valve In Purse
CDR Don Boots
LMP Move To Aft Cabin Area
Unstow LMP Boots, Purge Valve In Purse

Stow IV Gloves In Bot Boot Comp
LMP Don Boots
Unstow LMP OPS
Remove Pallet, Stow In Jett Bag

Hand LMP OPS To CDR For Checkout
Unstow CDR OPS
Remove Pallet, Stow In Jett Bag
Perform OPS Check (Both)

Stow LMP OPS On RH Floor Under Dump Vlv
LMP Move To LMP Station
Stow CDR OPS On LH Eng Cover

Apply Antifog (ISA Back Pkt) 2 COATS
Stow EMU Maint Kit In Purse
Unstow LEVA's
Stow LEVA's, Then Helmets On RH Eng Cov

Stow EV Gloves On Comm Panels
Stow LEVA Bags In SRC Area
Disconnect 3 Armrests, CDR LH,
LMP RH & LH, Stow In Jett Bag

P06E
CB(11) PGNS: IMU OPR - Open
PRO (Hold In Until STBY Lt - On)
UPDATA LINK - OFF

Fwd Hatch Handle - UNLOCK

PLSS DONNING :58

LMP 1st:
Set PLSS On Mid-Step
Retrieve OPS, Unstow Antenna Lead
Verify OPS Reg Decay, Unstow Nozzle
Secure Flap

Attach OPS To PLSS
Connect OPS Antenna Lead To PLSS
Verify Sublimator Exhausts Clear

Unstow PLSS Straps & Hoses
Remove Elect Dust Cap, Stow In Purse
Verify DIVERTER, O2, FEEDWATER - OFF
Connect Battery Cable

Verify The Following Locked:
OPS To PLSS
OPS Antenna To PLSS
PLSS Battery Connection

Don PLSS/OPS, Lift PLSS Hoses Above
LH Lower Strap

Connect PLSS O2 Hoses To PGA
Verify DIVERTER, O2, FEEDWATER - OFF
Unstow OPS O2 Hose

CDR Repeat PLSS DONNING

Unstow RCU's
Connect RCU To PGA Upper Straps
Verify RCU Controls:
PUMP, FAN - OFF (Left) MODE SEL-0

Connect RCU To PLSS, Snap OPS O2 Hose
To Side of PLSS

(Leave Cabin Repress CB Open For Manual Repress)

Disconnect PLSS H20 From PGA
Connect LM H20
CB(16) ECS: LCG PUMP - Close
Adjust LCG Cooling Gradually

PLSS Mode (Both) - O
Connect To LM Comm(Audio CB, Biomed Sw)

AUDIO (CDR & LMP)
- VHF A - RCV
- VHF B - OFF
- MODE - ICS/PTT
- RELAY - OFF

COMM:
S-BD XMTR/RCVR - PRIM
VHF - OFF, ON, OFF, OFF, LEFT, HI
RECORDER - OFF
UPLINK SQUELCH-OFF

PLSS O2 RECHARGE :10

Verify DES O2 >38%

Connect LM O2 To PLSS (LMP's 1st)
PLSS FILL - OPEN Then CLOSE After 2 Min

PLSS Mode - AR (O2 QTY ~85%)
PLSS Mode - O

Repeat O2 Recharge For CDR PLSS

Stow O2 Supply Hose

PLSS/OPS DOFFING :16

Disconnect OPS, Actuator From RCU's
Disconnect RCU's From PGA
Verify Pump, Fan, Mode Sel-Off
Discon RCU's From PLSS,Stow On Mid-Step

Disconnect PLSS O2 Hoses
Doff PLSS/OPS (LMP 1st)
Stow OPS O2 Hose, Actuator, & Antenna Blade, Leave Flaps Open For Checkout
Stow LMP PLSS On Floor
Stow CDR PLSS On Mid-Step

Unstow Disp Cont (LHSSC), Set On LH Fwd Floor
Install Gas Conn Plugs (Purse) In PGA

CAUTION: Insure PLSS LiOH Carts & Batts Numbered 1 & 2 Replaced With 3 Or 4

CDR 1st:
Change PLSS Batt, Stow In Disp Cont
Connect Cable To Battery
Stow PLSS Hoses & Straps
Change LiOH Cart, Temp<130°-Read Decals

Disconnect OPS Antenna Connector
Remove OPS & Stow Antenna Connector
Verify OPS O2 Press 5380 - 6380
Stow CDR OPS On LH Eng Cover, End Up
Stow CDR PLSS In Recharge Station

Stow LMP PLSS On Mid-Step, Repeat Above

Stow LMP OPS On Floor Under Dump Vlv
Stow PLSS On Floor Against Hatch

Stow RCU's On Data File
Stow Disp Cont On Mid-Step Under PLSS

POST EVA CABIN CONFIGURATION :43

Stow CSRC (Mid-Step) In ISA Top Pkt
Unstow Scale (Bot LHSSC)

Empty ETB As Follows:
Weigh Sample Bag, Report To Hou, Stow Bag In LHSSC
Replace 70mm Camr Mag With B&W LL, MM
Stow 3-16mm Mags In RHSSC
Stow Map As Reqd
Stow Return Items In ISA Back Pkt
Stow Lens/Scribe/Brush In ISA Back Pkt

Stow In ETB:
- BSLSS
- 2-70mm Camrs With B&W Mags
- 1-B&W Mag KK
- Polarizing Filter (RHSSC)
- 3-16mm Mags FF, GG, HH
- EVA 2 Map

Unstow Jett Bag (LHSSC)
Place ETB Inside Jett Bag, Stow On RH Cabin Floor, Fwd

Weigh SRC, Report To Hou
CDR Move To Aft Cabin
Stow SRC In Lower Comp

Stow CDR OPS In Top Comp
Stow Scale In Purse

Verify Powerdown CB Configuration
MODULATE - PM

Unstow Lunar Surface Checklist, 4-4
Stow EVA 1 Prep & Post Card

Verify EVA CB Configuration
Verify No Fog RH Window
Tie Jett Bag, Transfer to Eng Cover

Don EV Gloves & Verify:
  Wrist Locks (4) - Locked
  Glove Straps (4) - Adjusted

NOTE: If PGA Biting, PLSS O2 - ON/OFF

PLSS DIVERTER - MIN (Verify)
PLSS PUMP - ON, Rt

PRESS REG A & B - EGRESS

PRESSURE INTEGRITY CHECK :52

PLSS O2 - ON (Tone-On, O2 Flag-0)
Press Flag Clear (3.1-3.4 Psid)
Cuff Gage 3.7-4.0 Psig
O2 Flag Clear

PLSS O2 - OFF (Cuff Gage Decay <.3 Psig In 1 Min)
PLSS O2 - ON (Cuff Gage 3.7-4.0 Psig, Tone & O2 Flag May Come On)

CABIN DEPRESS :57

Confirm Go For Depress From Hou
CB(16)ECS: CABIN REPRESS - Open
CABIN REPRESS Vlv - CLOSE

Ovhd Or Fwd Dump Vlv - OPEN Then AUTO @ 3.5 Psia (Verify Cuff Gage Does Not Drop Below 4.8 Psig)
Verify:
  Cabin At 3.5 Psia
  LM Suit Circuit 3.6 To 4.3 Psia
  PGA > 4.8 Psig & Decaying

Start Wrist Watch :00

Ovhd Or Fwd Dump Valve - OPEN
Verify:
  Tone-On & H2O Flag - A (1.2-1.7 Psia)
  PGA > 4.8 Psig & Decaying

Partially Open Fwd Hatch

FINAL PREP FOR EGRESS :03

PLSS FEEDWATER - OPEN (H2O Flag - Clear In About 4 Min)

Fwd Hatch - Open

Rest Until Cooling Sufficient
Verify:
  PGA 3.7 To 4.8 Psig
  CWEA Status:
  Caution
  PREAMPS
  ECS

  H2O SEP COMP Lt - ON

Lighting: ANUN/NUM - DIM
DET - STOP
Release PLSS Antennas
Lower EV Visor :10

POST EVA 1

PLSS FEEDWATER - CLOSE
Fwd Hatch - Close & Lock
Dump Valves (Both) - AUTO

NOTE: PLSS O2 & PRESS Flags May Come On During Repress. If PLSS O2 <10% Manually Control Cabin Repress To Maintain Positive PGA Pressure. (Leave Cabin Repress CB Open For Manual Repress)

Lighting: ANUN/NUM - BRIGHT

CABIN REPRESS - AUTO
CB(16)ECS: CABIN REPRESS - Close
MASTER ALARM & CABIN Warning Lt - On
Verify Cabin Press Increasing
PRESS REG A & B - CABIN

PLSS O2 - OFF @ Cabin > 2.5 Psia

CABIN Warning Lt - Off
Verify Cabin Press Stable At 4.6-5 Psia
Use Purge Valve To Depress PGA As Reqd
DET - Set/Up :00

POST EVA SYSTEMS CONFIGURATION :00

CABIN GAS RETURN - AUTO
SUIT CIRCUIT RELIEF - AUTO (Verify)
SUIT GAS DIVERTER - PUSH-CABIN

Verify EVA CB Configuration
CB(16) ECS: SUIT FAN 2 - Close
  SUIT FAN ΔP- Close
ECS Caution & H2O SEP Comp Lts - Out

Doff Gloves, Stow On Comm Panels
Doff Helmets With Visors, Stow On RH Eng Cover, Top ETB

Verify Safety On Dump Valve
DES H2O Vlv - OPEN
Remove Purge Valve, Stow In Purse
Discon OPS O2 Hose

Connect LM O2 Hoses

SUIT ISOL (Both) - SUIT FLOW
PLSS PUMP - OFF (Left)
PLSS FAN - OFF (Left)

PRESS REG A & B - CABIN

PREP FOR EQUIPMENT JETTISON :26

Verify DES O2 QTY > 20%

Fwd Hatch Handle - UNLOCK

Doff Lunar Boots, Stow In Disp Cont
Stow RCU's In Disp Cont
Unstow PLSS Condensate Container, Stow In Disp Cont

Remove Armrest, Stow In Disp Cont
Tie Disp Cont
Position PLSS's For Jettison, Eng Cover & Mid-Step

Clean & Lub Wristrings As Reqd
PGA Diverter Vlvs - Horizontal
Don EV Gloves
Check PGA Connectors

PRESS INTEGRITY CHECK :38

NOTE: LM Suit Circuit Shall Not Be Maintained At Elevated Press >5 Min

SUIT GAS DIVERTER - PULL-EGRESS (Ver)
CABIN GAS RETURN - EGRESS (Verify)
SUIT CIRCUIT RELIEF - CLOSE

PRESS REG A - EGRESS
PRESS REG B - DIRECT O2
Monitor Cuff Gage To 3.7 - 4.0 Psig Then PRESS REG B - EGRESS (Cuff Gage Decay <.3 Psig In 1 Min)

SUIT CIRCUIT RELIEF - AUTO (Suit Ckt Press Decays To 4.8 Psia)

CABIN DEPRESS FOR JETTISON :41

CB(16)ECS: CABIN REPRESS - Open
Ovhd Or Fwd Dump Valve - OPEN Then AUTO At 3.5 Psia
(Verify Cabin Press 3.5 Psia & LM Suit Circuit 3.6 To 4.3 Psia & Decaying)

Ovhd Or Fwd Dump Vlv - OPEN (Verify LM Suit Circuit 3.6 To 4.3 Psia)

HATCH OPENING :44

Partially Open Fwd Hatch
Ovhd Or Fwd Dump Valve - AUTO

Fwd Hatch - Full Open

Jettison The Following:
Disp Cont
PLSS On Mid-Step
PLSS On Eng Cover

Verify Items Clear Of Ascent Stage

Fwd Hatch - Close & Lock

CABIN REPRESS :48

Dump Valves(Both)- AUTO (Verify)
CABIN REPRESS - AUTO (Verify)

CB(16)ECS: CABIN REPRESS - Close
MASTER ALARM & CABIN Warning Lt - On
Verify Cabin Press Increasing
PRESS REG A & B - CABIN

CABIN Warning Lt - Off
Verify Cabin Press Stable At 4.6-5 Psia

CABIN GAS RETURN - AUTO
SUIT GAS DIVERTER - PUSH-CABIN

Doff Gloves, Stow On Comm Panels
Doff Helmets W/Visors, Stow On Eng Cov
VHF ANT SEL - AFT
Verify Safety On Dump Valve

Unstow Lunar Surface Checklist, 7-4
Stow EVA 2 Prep & Post Card

FINAL PREP FOR EGRESS :03

PLSS FEEDWATER - OPEN (H2O Flag - Clear In 2-4 Min)

Fwd Hatch - Open

Rest Until Cooling Sufficient
Verify:
PGA 3.7 To 4.8 Psig
CWEA Status:
Caution
PREAMPS
ECS

H2O SEP COMP Lt - ON

Lighting: ANUN/NUM - DIM
DET - STOP
Release PLSS Antennas
Lower EV Visor :10

POST EVA 2

PLSS FEEDWATER - CLOSE
Fwd Hatch - Close & Lock
Dump Valves (Both) - AUTO

NOTE: PLSS O2 & PRESS Flags May Come On During Repress. If PLSS O2 <10% Manually Control Cabin Repress To Maintain Positive PGA Pressure. (Leave Cabin Repress CB Open For Manual Repress)

Lighting: ANUN/NUM - BRIGHT

CABIN REPRESS - AUTO
CB(16)ECS: CABIN REPRESS - Close
MASTER ALARM & CABIN Warning Lt - On
Verify Cabin Press Increasing
PRESS REG A & B - CABIN

PLSS O2 - OFF @ Cabin > 2.5 Psia

CABIN Warning Lt - Off
Verify Cabin Press Stable At 4.6-5 Psia
Use Purge Valve To Depress PGA As Reqd
DET - Set/Up :00

POST EVA SYSTEMS CONFIGURATION :00

Verify EVA CB Configuration
CB(16) ECS: SUIT FAN 2 - Close
SUIT FAN ΔP - Close
ECS Caution & H2O SEP Comp Lts - Out

Doff Gloves, Stow On Comm Panels
Verify Safety On Dump Valve
DES H2O VLV - OPEN

Remove Purge Valves, Stow In Purse
Discon OPS O2 Hose
Connect LM O2 Hoses, R/R & B/B
SUIT ISOL (Both) - SUIT FLOW

PLSS PUMP - OFF (Left)
PLSS FAN - OFF (Left)

Disconnect PLSS H2O From PGA
Connect LM H2O To PGA
CB(16) ECS: LCG PUMP - Close

PLSS Mode (Both) - O
Connect To LM Comm(Audio CB, Biomed Sw)

AUDIO (CDR & LMP)
VHF A - OFF
VHF B - OFF
MODE - ICS/PTT
RELAY - OFF

COMM:
S-BD XMTR/RCVR - PRIM
VHF - OFF, OFF, OFF, OFF, LEFT, HI
RECORDER - OFF

PLSS/OPS DOFFING :10

Disconnect OPS Actuator From RCU's
Disconnect RCU's From PGA
Verify Pump, Fan, Mode Sel - Off
Disconn RCU's From PLSS, Stow On Mid-Step

Disconnect PLSS O2 Hoses
Doff PLSS/OPS (LMP 1st)
Stow OPS O2 Hose, Actuator & Antenna Blade - Leave Flaps Open For Checkout
Stow LMP PLSS On Floor
Stow CDR PLSS On Mid-Step

Unstow Disp Cont(LHSSC), Set On LH Fwd Floor
Install Gas Conn Plugs (Purse) In PGA

CDR 1st:
Disconnect OPS Antenna Connector
Remove OPS, Stow Antenna Connector

Perform OPS Checkout
Stow OPS On Engine Cover, Top ETB
Stow PLSS Hoses & Upper Straps
Remove Lower PLSS Straps, Clip Straps Together, D-Ring (Name-To-Name)

Remove Yo-Yo, Stow In Disp Cont
Stow Straps In RHSSC (FECAL EMESIS)
Stow PLSS On Floor

LMP Stow PLSS On Mid-Step, Repeat Above

Verify Powerdown CB Configuration
CB(11) HEATERS: RR OPR - Close
RR STBY - Open

PLSS PTT(CDR) - MAIN (Rt)

NOTE: No MSFN Reception In PLSS Mode B

PLSS Mode(CDR) - B, Blade-CCW (Tone-On, Vent Flag - P, Press Flag- O, O2 Mom)
PLSS O2 Press Gage >85%
Perform Comm Check With LMP

PLSS Mode (LMP)- B, Blade-CCW (Tone-On)
PLSS Mode (CDR)- A, Wheel-CCW (Tone-On)
Verify Voice Comm With Each Other

PLSS Mode (Both) - AR (Tone-On)

NOTE: (AR) Wheel-Hou, Blade-EVA

Perform Comm & TM Check With Hou & Comm Check With Each Other
Read PLSS O2 Qty To Hou

NOTE: If Comm Is NO GO With Hou
S-BD MOD - PM
Verify COMM & TM

FINAL SYSTEMS PREP :27

CB(16) ECS: CABIN REPRESS - Close (Ver)
SUIT FAN ΔP - Open
SUIT FAN 2 - Open
Verify ECS Caution & H2O SEP COMP Lts - On (~1 Min)

SUIT GAS DIVERTER - PULL-EGRESS
CABIN GAS RETURN - EGRESS
SUIT CIRCUIT RELIEF - AUTO (Verify)

OPS CONNECT :28

LMP 1st - Unstow OPS O2 Actuator
Connect Actuator To RCU
SUIT ISOL - SUIT DISC
Discon LM O2 Hoses, Secure About PGA

Connect OPS O2 Hose To PGA B/B
Retrieve Purge Valve (Purse) - Verify Closed, Locked & LO
Install Purge Valve In PGA R/R
PGA Diverter Valves - Vertical

CDR Repeat OPS CONNECT

Verify Items Prepared For Jettison:
ECS LiOH Cartridge & Brkt
Hammocks
PLSS Batteries & LiOH Carts
Food Waste, Urine Bags
Feedwater Bags & Scale

Drink
DES H2O VLV - CLOSE

HELMET/GLOVE DONNING :37

Position Mikes (Both)
PLSS FAN - ON, Rt (Vent Flag - Clear)
Don Helmets With LEVA's, Check Drink Bag Position

LCG - COLD, As Reqd
CB(16) ECS: LCG PUMP - Open
Disconnect LM H2O Hose
Connect PLSS H2O Hose
Stow LM Hoses (CDR's To ECS Handhold)

Verify The Following:

Helmet & Visor	(2)	- Aligned & Adjusted
Torso Tiedown	(2)	- Adjusted
O2 Connectors	(6)	- Locked
Purge Valves	(2)	- Locked
H2O Connectors	(2)	- Locked
Comm Connectors	(2)	- Locked

Verify EVA CB Configuration

Don EV Gloves & Verify:
Wrist Locks (4) - Locked
Glove Straps (4) - Adjusted

NOTE: If PGA Biting, PLSS O2 - ON/OFF

PLSS DIVERTER - MIN (Verify)
PLSS PUMP - ON, Rt

PRESS REG A & B - EGRESS

PRESSURE INTEGRITY CHECK :52

PLSS O2 - ON (Tone-On, O2 Flag - O)
Press Flag Clear (3.1-3.4 Psid)
Cuff Gage 3.7-4.0 Psig
O2 Flag Clear

PLSS O2 - OFF (Cuff Gage Decay <.3 Psig In 1 Min)
PLSS O2 - ON (Cuff Gage 3.7-4.0 Psig, Tone & O2 Flag May Come On)

CABIN DEPRESS :57

Confirm Go For Depress From Hou
CM(16)ECS: CABIN REPRESS - Open
CABIN REPRESS VLV - CLOSE

Ovhd Or Fwd Dump Vlv - OPEN Then AUTO @ 3.5 Psia (Verify Cuff Gage Does Not Drop Below 4.8 Psig)
Verify:
Cabin At 3.5 Psia
LM Suit Circuit 3.6 To 4.3 Psia
PGA > 4.8 Psig & Decaying

Start Wrist Watch :00

Ovhd Or Fwd Dump Valve - OPEN
Verify:
Tone-On & H2O Flag - A (1.2-1.7 Psia)
PGA > 4.8 Psig & Decaying

Partially Open Fwd Hatch

~~12/21/70~~ 1-12-71

EQUIPMENT PREP EVA 2

DET-Set/Up :30
Empty UCTA's
Check PGA Zippers, Verify Lock-Lock
Fill Drink Bags, Evac, Install

Stow Gas Connector Plugs In Purse
Empty PGA Pockets Into Purse
Verify Watch On PGA
CDR Move To Aft Cabin

CDR Don Boots
Unstow CDR OPS
Perform OPS Check (Both)
Stow Both OPS On Floor

Remove ETB From Jett Bag, Stow In LHSSC
Verify Eqpt In ETB:
- 2-70mm Camrs With B&W Mags LL, MM
- Polarizing Filter
- 1-Spare B&W Mag KK
- 3-16mm Mags FF, GG, HH
- EVA 2 Map
- BSLSS

Stow ETB On Mid-Step

LMP Don Boots
Unstow PLSS Condensate Container, Stow On Rock Box

Apply Antifog (Purse) 2 COATS
Stow Visors & Helmets On RH Eng Cover
Tie Disp Cont, Stow On LH Eng Cover
FWD Hatch Handle - UNLOCK

PLSS DONNING :57

LMP 1st:
Set PLSS On Mid-Step
Retrieve OPS, Unstow Antenna Lead
Verify OPS Reg Decay, Unstow Nozzle
Secure Flap

EVA 2 PREP & POST

Attach OPS To PLSS
Connect Antenna Lead To PLSS
Verify Sublimator Exhausts Clear

Unstow PLSS Straps & Hoses
Verify DIVERTER, O2, FEEDWATER - OFF
Verify The Following Locked:
- OPS To PLSS
- OPS Antenna To PLSS
- PLSS Battery Connection

Don PLSS/OPS, Lift PLSS Hoses Above LH Lower Strap

Connect PLSS O2 Hoses To PGA
Verify DIVERTER, O2, FEEDWATER - OFF
Unstow OPS O2 Hose

CDR Repeat PLSS DONNING

Unstow RCU's
Connect RCU To PGA Upper Straps
Verify RCU Controls:
- PUMP, FAN - OFF (Left) MODE SEL - 0

Connect RCU To PLSS, Snap OPS O2 Hose To Side Of PLSS

PLSS COMM CHECK :17

Verify Powerdown CB Configuration
COMM: MODULATE - FM
CB(16) COMM: TV - Close (Verify)
Verify Voice Comm With Hou

Audio (CDR)
- S-BAND - T/R
- ICS - T/R
- RELAY - OFF
- MODE - VOX (VOX SENS MAX)
- VHF A - T/R
- VHF B - RCV

Audio (LMP)
- S-BAND - T/R
- ICS - T/R
- RELAY - ON
- MODE - VOX (VOX SENS MAX)
- VHF A - T/R
- VHF B - RCV

COMM:
S-BD XMTR/RCVR - SEC
VHF - VOICE, ON, OFF, ON, OFF, HI
RANGE - RANGE
SQUELCH A & B - Noise Thres + 1-1/2
RECORDER - ON
VHF Antenna - EVA
UPLINK SQUELCH - ENABLE

LMP Connect To PLSS Comm (Audio CB Open/Close)

PLSS PTT (LMP) - MAIN (Rt)
PLSS Mode(LMP) - A, Wheel-CCW (Tone-On, Vent Flag- P, Press Flag- 0, O2 Mom)
PLSS O2 Press Gage >85%
Perform Comm Check With CDR

NOTE: Unstow PLSS Antenna If It Transmits Garbled And/Or Loses TM

CDR Connect To PLSS Comm (Audio CB Open/Close)

Audio (CDR)
- VHF A - OFF
- VHF B - OFF

PLSS PTT(CDR) - MAIN (Rt)

~~12/21/70~~ 1/21/71

PREP FOR EGRESS

Configure CB's As Required
Doff IV Gloves, Stow Under Netting Behind LMP
Doff Helmets, Verify Feedport Cover Installed, & Stow Helmets On Ceiling
Verify Wristwatch Donned
FWD Hatch Handle - UNLOCK
Verify With CMP That Tunnel Is Depressed

Verify - PGA Zipper Locked
Stow COAS On Fwd Window Mount
Stow DEDA & DSKY Desk, Loose Items
Unstow CSRC (ISA, Top Pkt) Put in PGA Pkt
Stow Other Items As Desired For XFER
SEQ MAGS (6-RHSSC, 1-CAM, 1-ISA)
70mm MAGS (3-RHSSC 2nd Shelf, 1-CAM-RHSSC, 1-ISA)
CSC CASSETTE MAG-ISA
PPK-RHSSC, LHSSC
TOOL B IF REQD

Stow PGA Gas Connector Plugs In RHSSC (Fecal Emesis)
Unstow OPS Straps & Purge Valves From RHSSC (Fecal Emesis)
Purge Vlvs - Hi
Don Purge Valves (R/R) (LH Side)
Don OPS Straps (Break Stitches 2 Places, Remove Keeper, Extend To Max Length, Route Thru PGA LH D-RING With Adjustable Strap On RH Side)

OPS DONNING (LMP 1st)
Unstow OPS & Checkout
Verify OPS Reg Decays To 2.5 PSI(~3 Min)
Unstow OPS O2 Gas Hose
Secure OPS To OPS Straps (Route Under LM Hoses, Do Not Twist Strap)
Connect O2 Hose To PGA (B/B)
Fix OPS Flaps To Expose Press Gage
CDR Repeat OPS DONNING

CONTINGENCY EVT (2 OPS)

CB(11) ECS: CABIN FAN - OPEN (VERIFY)

CDR Unstow Lifeline/Tethers - LHSSC
Attach Waist Tether Hooks To PGA (Connect To LMP RH Side, Route In Front of LMP & Behind CDR & Connect To CDR LH Side, Verify Hooks Locked)
Verify LM O2 Hoses - R/R, B/B

PGA Diverter Valves - Vertical
Don Helmets
Don LEVA's, Verify Helmet Aligned

Secure Transfer Items
CK Conn - Hel, O2, Comm, Purge Vlvs
Verify LM Restraints Removed
Don EV Gloves, Verify Locked

SUIT INTEGRITY CHECK

SUIT GAS DIVERTER - PULL-EGRESS
CABIN GAS RETURN - EGRESS
SUIT CIRCUIT RELIEF - CLOSE

PRESS REG A - EGRESS
PRESS REG B - DIRECT O2
Monitor CUFF GAGE 3.7-4.0 PSIG Then PRESS REG B - EGRESS (Cuff Gage Decay <.3 Psig in 1 Min)
Verify Purge Valves Accessible

SUIT CIRCUIT RELIEF - AUTO (SUIT CKT PRESS DECAYS TO 4.8 PSIA)
Confirm CSM Side Hatch Open And CMP Go For LM Depress

LCG - COLD, As REQ'D
CB(16) ECS: LCG Pump - Open
Disconnect LM H2O Hoses
Inspect EMU

CABIN DEPRESS

CB(16) ECS: CABIN REPRESS-OPEN
CABIN REPRESS VLV - CLOSE (VERIFY)
Fwd Dump Valve - OPEN Then AUTO At 3.5 Psia
Verify LM Suit Press 3.6-4.3 Psia And Decaying Slowly
Fwd Dump Valve - OPEN
Monitor Cabin Press To 0 Psia
Verify LM Suit Press 3.6-4.3 Psia

HATCH OPENING

Open Hatch
LMP Verify XFER Items Ready

VERIFY/PERFORM:

CB(11) STAB/CONT:	ATCA (PGNS)	- OPEN
	AELD	- OPEN
	ATT DIR CONT	- OPEN
CB(16) STAB/CONT:	ATCA (AGS)	- OPEN
	AELD	- OPEN

Turn Card Over And Review Transfer Method

12/21/70

EVT (DOCKED)

CDR Egress Feet First and Transfer To CSM, LMP Tend Lifeline

CDR Ingress CSM Head First, Face Toward MDC, and Move To LEB
Retrieve C 02 Hoses and Comm Umbilical

CMP Connect C Comm Umbilical To CDR

CDR Configure Audio Panel As Desired

CDR Secure Position In LEB & Tend Lifeline For LMP
LMP Egress Feet First and Transfer to CSM

LMP Ingress CSM Feet First, Face Toward MDC, and Assume Position In Center Couch Area
CDR Connect R Electrical Umbilical to LMP
CMP Close Hatch

EVT (UNDOCKED, STABLE)

CSM Maneuver Apex to LM Forward Hatch

CDR, Then LMP, Egress Feet First, Move Along Handrails to CSM
LMP Tend Lifeline

CDR Ingress CSM, Head First, Face Toward MDC, And Move To LEB
Retrieve C 02 Hoses And Comm Umbilical

CMP Connect C Comm Umbilical To CDR

CDR Configure Audio Panel As Desired
Secure Position In LEB And Tend Lifeline For LMP
LMP Ingress CSM Feet First, Face Toward MDC, and Assume Position In Center Couch Area
CDR Connect R Electrical Umbilical To LMP
CMP Close Hatch
****
LEVA - Lower As Required
OPS 02 - On
SUIT ISOL VALVES (Both) - SUIT DISC
Purge Valves - OPEN (Give Mark To CMP For T+25 Min On OPS)
Verify 02 Flow & PGA Press 3.4-4.0 Psig

Disconnect LM 02 Hoses

Disconnect LM Comm Umbilical
Stow LM Hoses

CDR Transfer To CSM LEB (LMP Manage Lifeline)
LMP Transfer To CSM Center Couch Area (CDR Manage Lifeline)

****

EVT (UNDOCKED), UNSTABLE

CSM Maneuver to LM

CDR Egress Feet First, Move to EVA Handrail Clear of Hatch
LMP Tend Lifeline

LMP Egress, Move Up EVA Handrail

CDR and LMP Push Away from LM at Same Time (Give Signal, Pull In, Push Off)

CSM Maneuver Apex to CDR and LMP

CDR and LMP Use CSM Handholds to Move To Side Hatch

CDR Ingress CSM, Head First, Face Toward MDC, And Move To LEB
Retrieve C 02 Hoses And Comm Umbilical

CMP Connect C Comm Umbilical To CDR

CDR Configure Audio Panel As Desired
Secure Position in LEB And Tend Lifeline For LMP
LMP Ingress CSM Feet First, Face Toward MDC, and Assume Position In Center Couch Area
CDR Connect R Electrical Umbilical To LMP
CMP Close Hatch

Appllo Flight Data File
Pen & Ink

Distribution List

Bond Distribution List

2	J. L. Nevins	MIT Instrument Lab.
		75 Cambridge Parkway
1	R. Larson	Cambridge, Mass. 02142
1	PA/J. A. McDivitt	
1	PP3/H. L. Tash	
1	PD6/MSE - S. Blackmer	
1	PA/R. L. Kubicki	
1	CA/D. K. Slayton	
1	CF/W. J. North	
1	CF14/J. W. Bilodeau	
1	CF41/P. C. Kramer	
1	CF51/L. G. Richard	
3	CF71/H. A. Kuehnel	
2	CF31/L. D. Allen	
1	CF61/J. W. O'Neill	
1	CF81/S. Faber	
1	CF21/M. E. Dement	
1	CF62/T. R. Lindsey	
1	CF62/E. Pippert	
1	CF62/C. L. Stough	
3	CF61/J. Owens	
2	CF61/W. Beheler	
1	CF62/T. W. Holloway	
1	CF43/C. Lewis	
1	CF44/S. Grega	
1	NA/M. L. Raines	
3	CF22/C. Thomas	
1	CF23/D. J. Hudson	
1	CF24/J. Baker	
1	CF24/G. F. Steele	
1	CF51/J. Covington	
7	FM13/M. A. Collins, Jr.	
2	CF81/M. O. Brown	
1	CF8/L. Harvey	
1	CF413/J. Shacter	
2	TM/J. Zarcaro	
2	CF81/G. F. Prude	
1	CB/D. Scott	
1	CB/A. Worden	
1	CB/J. Irwin	
1	CB/D. Gordon	
1	CB/V. Brand	
1	CB/H. H. Schmitt	
1	CB/Heize	
1	CB/Parker	
1	CB/B. McCandless	
16	CF21/W. H. Todd/J. Pearce	
35	FC/Division Office	
15	EA8/P. Deans	
1	CF62/S. H. Gardner	
2	TA/A. J. Calio	
1	CB/T. P. Stafford	
1	CB/Conrad - Skylab	
1	CB/F. Haise	
1	CB/J. W. Young	
1	CB/T. K. Mattingly	
1	CB/C. M. Duke	
6	CFK/Frank Hughes - Console Copies	
1	CFK/Chuck Bennett	

LM CUE CARD
Pen & Ink 1/26/71

FLIGHT DATA FILE PEN & INK CHANGES

The enclosed pen and ink changes are Flight Data File (FDF) approved and are to be included in the Apollo 14 FDF articles as defined below.

1. Page i

   a) Following "Pen & Ink 1/21/71" add "Pen & Ink 1/26/71"

   b) Change "4 thru 6 . . . 12/21/70" to "4 . . . 1/26/71 (P&I)
      5 and 6 . . . 12/21/70"

2. Page 4

   a) Change date on page from "12/21/70" to "1/26/71"

   b) Change date on cue card face from "11/9/70" to "1/26/71"

   c) Add "Y-211 (-)(100 FT)" above "Y DOT - (PRESENT) (-) 270"

C E Wilkes
Book Manager

J. W. O'Neill
Supervisor

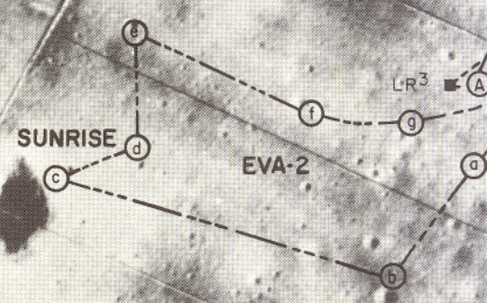
LANDING SITE 1

EVA 1

STATION	TASKS
A	• Deploy ALSEP Comprehensive sample • Do cuff checklist
y.	• Documented sample • Pan
z.	• Documented sample • "Football" size rock

EVA 2

STATION	CDR	TASKS COORDINATED	LMP
a.	• TDS • MET Track Photos • Describe Surface	• Double Core (M) • Describe Surface • Documented Sample	• LPM Point (M) • Pan
b.	• Pan	• Documented sample • Compare with Surface at a.	
b-c	• Watch for radial variations in materials toward Sunrise • Watch for changes in patterned ground; fillets		
c. Sunrise Rim	• Polarimetric Surveys	• Collect rock & Soil samples • Roll boulder, take 24 fps movie, crew movement, pan east, pan crater • Describe, photo boulders • EVA Comm	• Two pans on rim > 300 ft baseline
c.-d.	• Watch for radial variations in materials		
d.	• Description, contrast rock types, sizes, with Sunrise	• Documented Sample	• Pan • LPM
d-e	• Watch for radial variations in materials; sample		
e.	• Describe Surface	• Trench - do cuff checklist • Documented Sample • Single Core (HD)	• LPM (M) • Pan
f.	• Describe Surface	• Triple Core (M) • Documented Sample • Radial/diametric samples at a 10 m crater	• Pan
g.	• Pan • Description patterned ground	• Gas Sample (HD) • MSSC (HD) • Fillet Sample (HD) • Single core through large rock fillet (HD)	



LANDING SITE 2

EVA 1

STATION	TASKS
A	• Do cuff checklist • Deploy ALSEP • Comprehensive sample
h.	• Documented sample • Pan
i.	• Documented sample
j.	• Documented sample Football size rock

EVA 2

STATION	CDR	TASKS COORDINATED	LMP
k.	• TDS • MET Track Photos • Describe Surface	• Double Core (M) • Describe Surface • Documented Sample	• LPM Point (M) • Pan
k-m	• Observations on character of patterned ground relative to slope		
m.	• Pan	• Documented sample • Compare with Surface at k.	
n. Star Rim	• Polarimetric Surveys	• Collect rock & soil samples • Roll boulder, take 24 fps movie, crew movement, pan South, pan crater • Describe, photo boulders • EVA Comm	• Two pans on rim > 300 ft baseline
n-o	• Look for changes in patterned ground toward center of crater		
o. Star Center	• Description, contrast rock types, sizes, with Star rim (n)	• Documented Sample	• Pan
o-p	• Look for surface changes that may be related to approximate contact between Ridgey (west) and Smooth (east) units		
p.	• Describe Surface	• Trench - do cuff checklist • Documented Sample • Single Core (HD)	• LPM (M) • Pan
q. Halfway	• Describe Surface	• Triple Core (M) • Documented Sample • Radial/diametric samples at a 10 m crater	• Pan
q-r	• Observe possible changes in patterned ground; fillet development		
r. Doublet	• Pan • Description, patterned ground	• Gas Sample (HD) • MSSC (HD) • Fillet Sample (HD) • Documented Sample • Single core through large fillet	• LPM (HD)

LANDING SITE 1

EVA 1

STATION	TASKS
A	• ALSEP deployment • Do cuff checklist
CS	• Comprehensive sample
U Doublet (Intersection of N and S)	• Description • Documented sample • "Football" size rock • Pan
V Doublet (N)	• Description • Documented sample
W Doublet (S)	• Documented sample

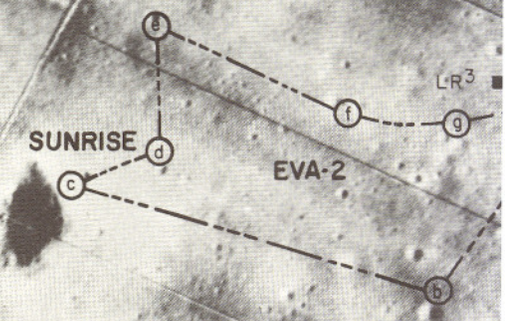
GENERAL FEATURES (Docum

- Solder-like glass blebs
- Patterned ground
- Changes in block and fragme
- Fragments in or near elonga secondary craters
- Proportion of microbreccia crystalline rock types
- Boulder tracks and slope re
- Rock fillets

EVA 2

STATION	CDR	
a.	• TDS • MET Track Photos • Describe Surface	• Doub • Desc • Docu
b.	• Pan	• Docu • Comp

b.	• Pan	• Documented sample • Compare with Surface at a.	
b-c	• Watch for radial variations in materials toward Sunrise • Watch for changes in patterned ground; fillets		
c. Sunrise Rim	• Polarimetric Surveys	• Collect rock & Soil samples • Roll boulder, take 24 fps movie, crew movement, pan east, pan crater • Describe, photo boulders • EVA Comm	• Two pans on rim > 300 ft baseline
c.-d.	• Watch for radial variations in materials		
d.	• Description, contrast rock types, sizes, with Sunrise	• Documented Sample	• Pan • LPM
d-e	• Watch for radial variations in materials; sample		
e.	• Describe Surface	• Trench - do cuff checklist • Documented Sample • Single Core (HD)	• LPM (M) • Pan
f.	• Describe Surface	• Triple Core (M) • Documented Sample • Radial/diametric samples at a 10 m crater	• Pan
g.	• Pan • Description patterned ground	• Gas Sample (HD) • MSSC (HD) • Fillet Sample (HD) • Single core through large rock fillet (HD)	



LANDING SITE 2

EVA 1

STATION	TASKS
A	• Do cuff checklist • Deploy ALSEP • Comprehensive sample
h.	• Documented sample • Pan
i.	• Documented sample
j.	• Documented sample Football size rock

EVA 2

STATION	TASKS CDR	COORDINATED	LMP
k.	• TDS • MET Track Photos • Describe Surface	• Double Core (M) • Describe Surface • Documented Sample	• LPM Point (M) • Pan
k-m	• Observations on character of patterned ground relative to slope		
m.	• Pan	• Documented sample • Compare with Surface at k.	
n. Star Rim	• Polarimetric Surveys	• Collect rock & soil samples • Roll boulder, take 24 fps movie, crew movement, pan South, pan crater • Describe, photo boulders • EVA Comm	• Two pans on rim > 300 ft baseline
n-o	• Look for changes in patterned ground toward center of crater		
o. Star Center	• Description, contrast rock types, sizes, with Star rim (n)	• Documented Sample	• Pan
o-p	• Look for surface changes that may be related to approximate contact between Ridgey (west) and Smooth (east) units		
p.	• Describe Surface	• Trench - do cuff checklist • Documented Sample • Single Core (HD)	• LPM (M) • Pan
q. Halfway	• Describe Surface	• Triple Core (M) • Documented Sample • Radial/diametric samples at a 10 m crater	• Pan
q-r	• Observe possible changes in patterned ground; fillet development		
r. Doublet	• Pan • Description, patterned ground	• Gas Sample (HD) • MSSC (HD) • Fillet Sample (HD) • Documented Sample • Single core through large fillet	• LPM (HD)

LANDING SITE 1

EVA 1

STATION	TASKS
A	• ALSEP deployment • Do cuff checklist
CS	• Comprehensive sample
U Doublet (Intersection of N and S)	• Description • Documented sample • "Football" size rock • Pan
V Doublet (N)	• Description • Documented sample
W Doublet (S)	• Documented sample

GENERAL FEATURES (

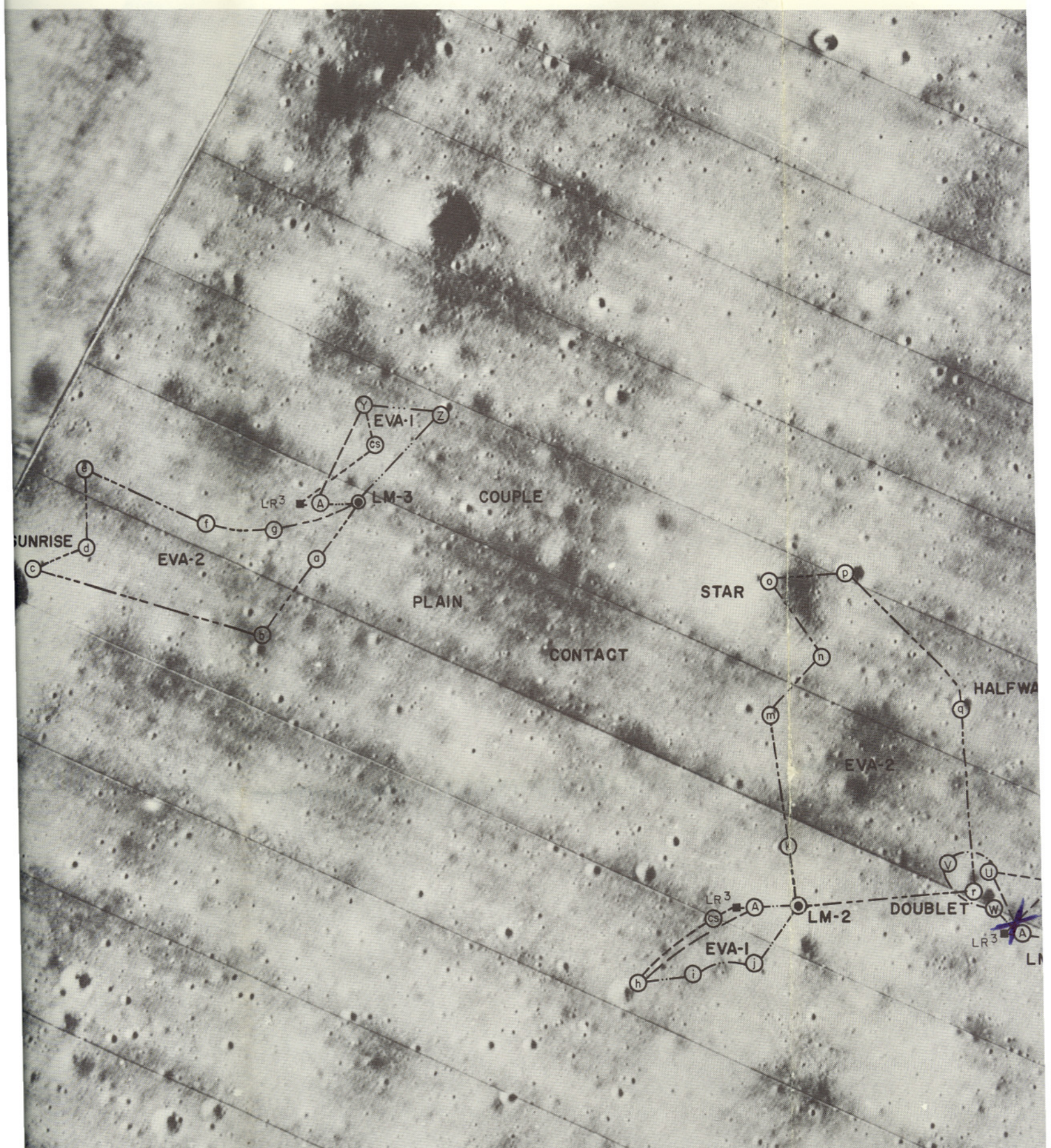
- Solder-like glass bleb
- Patterned ground
- Changes in block and
- Fragments in or near secondary craters
- Proportion of microbre crystalline rock typ
- Boulder tracks and sl
- Rock fillets

EVA 2

STATION	CDR
a.	• TDS • MET Track Photos • Describe Surface
b.	• Pan

FRA MAURO

APOLLO 14 LANDING SITE



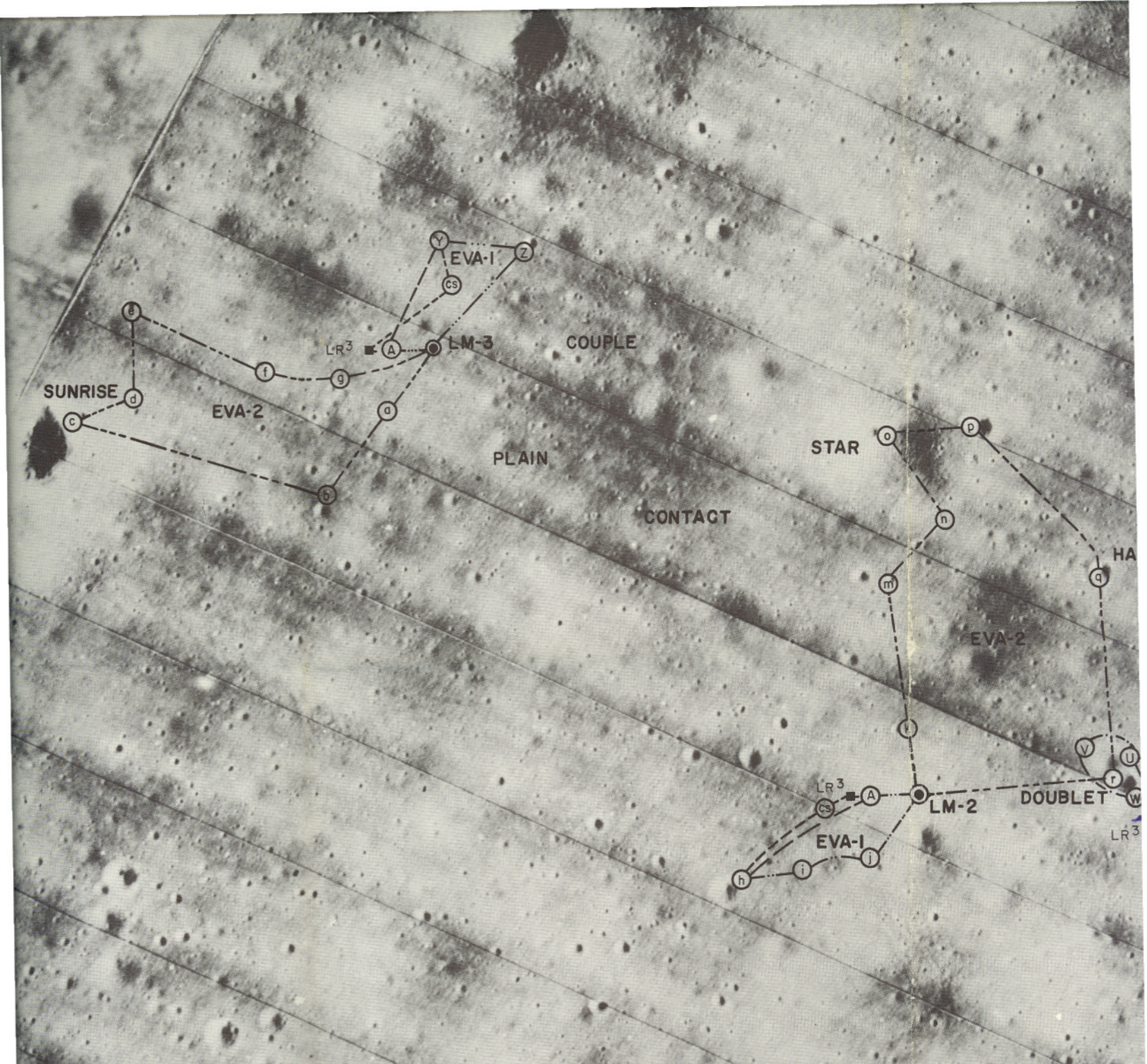
LANDING SITE 1

EVA 1

STATION	TASKS		
A	• ALSEP deployment • Do cuff checklist		
CS	• Comprehensive sample		
U Doublet (Intersection of N and S)	• Description • Documented sample • "Football" size rock • Pan		
V Doublet (N)	• Description • Documented sample		
W Doublet (S)	• Documented sample		
c. Cone Rim	• Polarimetric Surveys	• Collect rock & soi samples • Roll boulder, take fps movie, crew movement, pan we pan crater • Describe, photo bo • EVA Comm	
c.-d.		• Watch for radial v	
d. Flank	• Description, contrast rock types, sizes, with Cone	• Documented Sample	
e.	• Describe Surface	• Trench - do cuff checklist	

GENERAL FEATURES (Document and Sample)

- Solder-like glass blebs
- Patterned ground



LANDING SITE 1

EVA 1

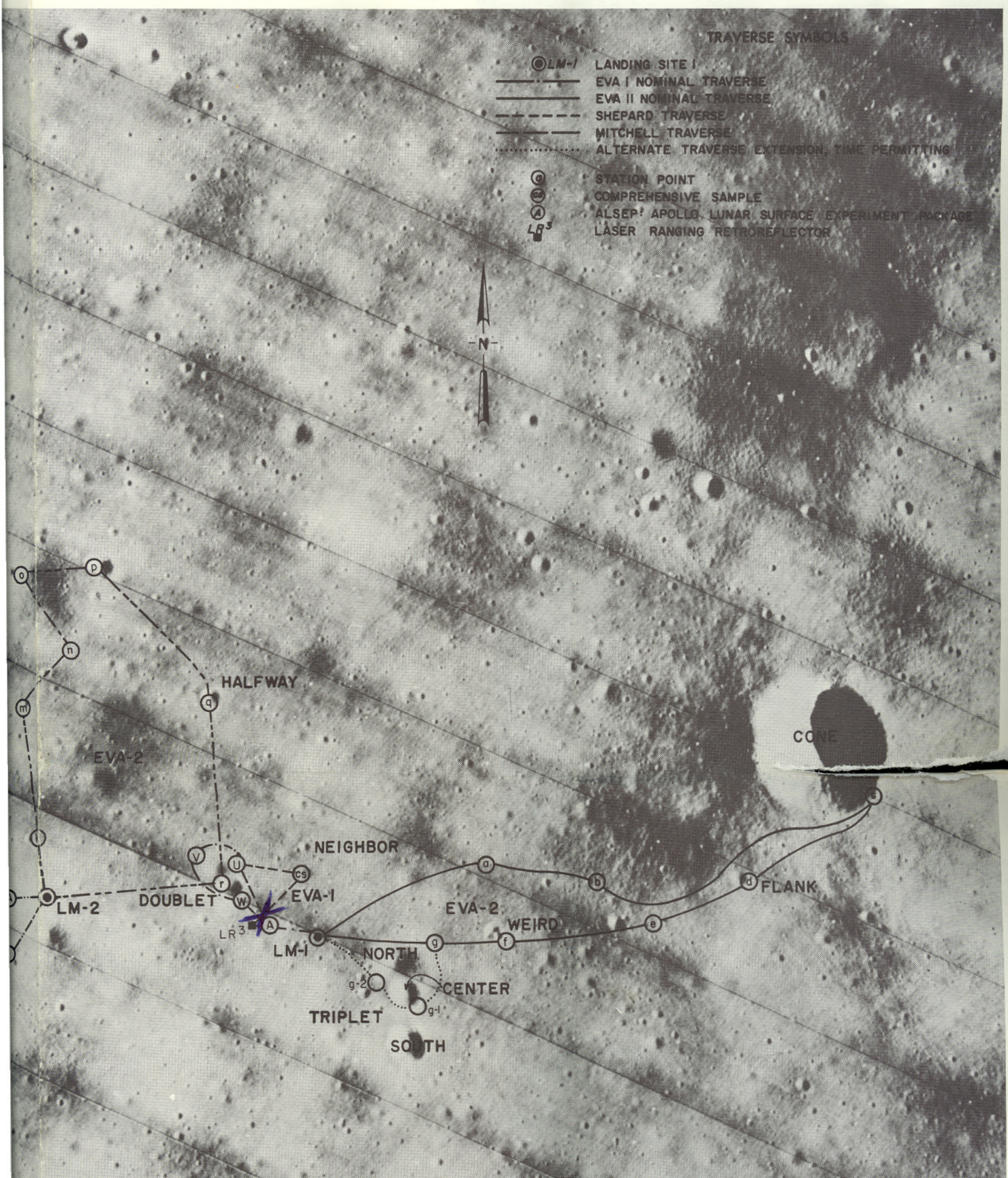
STATION	TASKS
A	• ALSEP deployment • Do cuff checklist
CS	• Comprehensive sample
U Doublet (Intersection of N and S)	• Description • Documented sample • "Football" size rock • Pan
V Doublet (N)	• Description • Documented sample
W Doublet (S)	• Documented sample

GENERAL FEATURES (Document and Sample)

- Solder-like glass blebs
- Patterned ground
- Changes in block and fragment angularity
- Fragments in or near elongate or secondary craters
- Proportion of microbreccia to crystalline rock types
- Boulder tracks and slope relations
- Rock fillets

EVA 2

STATION	TASKS CDR	TASKS Coordinated	TASKS LMP
a.	• TDS • MET Track Photos • Describe Surface	• Double Core (M) • Describe Surface • Documented Sample	• LPM Point (M) • Pan
b.	• Pan	• Documented Sample • Compare with Surface at a.	
c. Cone Rim	• Polarimetric Surveys	• Collect roc samples • Roll boulde fps movie movement, pan crate • Describe, pl • EVA Comm	
c.-d.		• Watch for r	
d. Flank	• Description, contrast rock types, sizes, with Cone	• Documented S	
e.	• Describe Surface	• Trench - do checklist • Documented S • Single Core	
f. Weird	• Describe Surface	• Triple Core • Documented S • Radial/diame samples a crater	
g. Triplet	• Pan • Description	• Gas Sample (• MSSC (HD) • Fillet Sampl • Football-siz	
g.-1 (S)		ALTERNATE • Documented S • Pan	
g.-2 (N)		• Documented S	

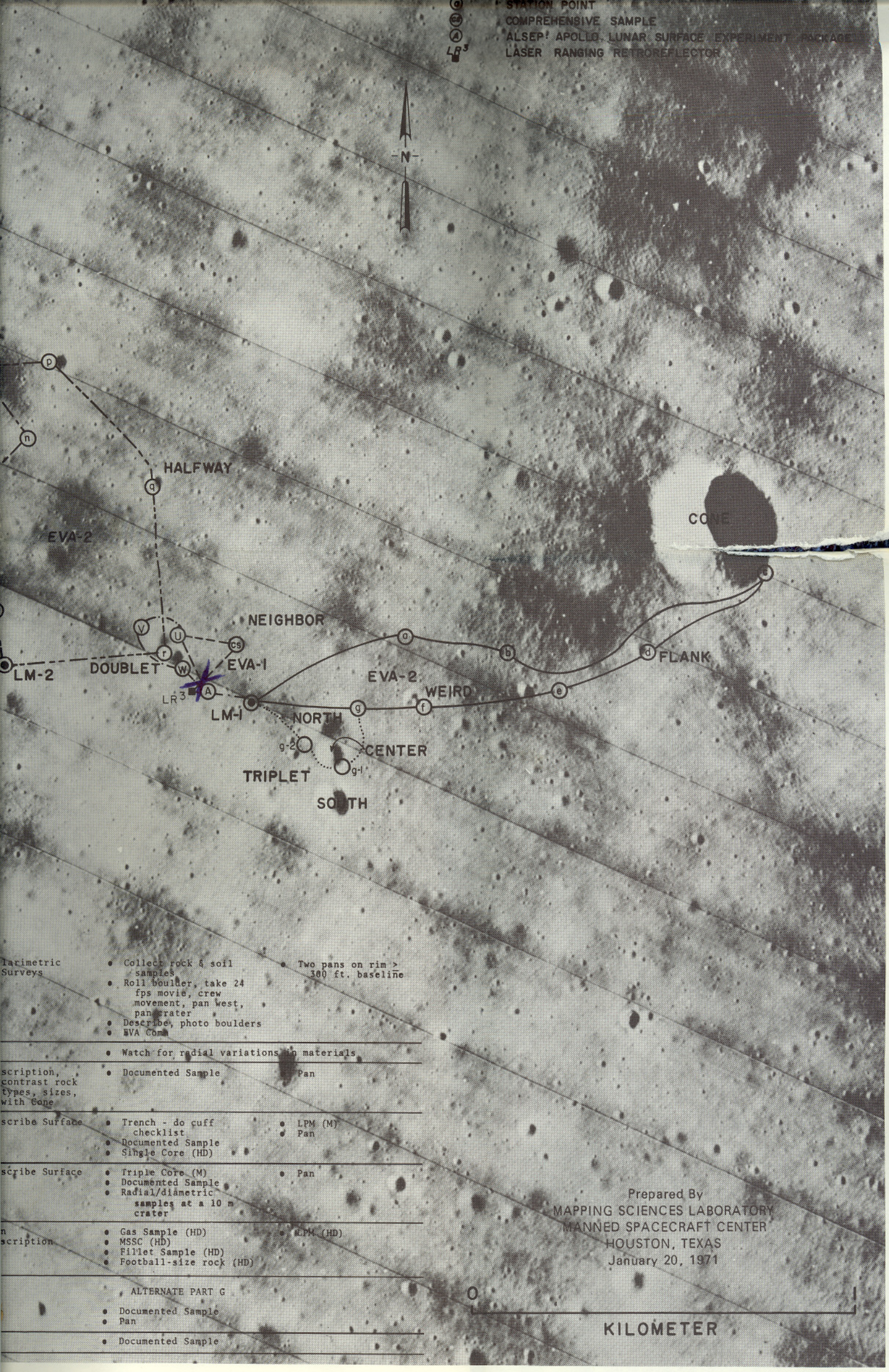


- Polarimetric Surveys
- Collect rock & soil samples
- Roll boulder, take 24 fps movie, crew movement, pan west, pan crater
- Describe, photo boulders
- EVA Comm
- Two pans on rim > 300 ft. baseline

- Watch for radial variations in materials

- Description, contrast rock types, sizes, with Cone
- Documented Sample
- Pan

- Describe Surface
- Trench - do cuff checklist
- Documented Sample
- LPM (M)
- Pan



larimetric Surveys	• Collect rock & soil samples • Roll boulder, take 24 fps movie, crew movement, pan west, pan crater • Describe, photo boulders • EVA Comm	• Two pans on rim > 300 ft. baseline
	• Watch for radial variations in materials	
scription, contrast rock types, sizes, with Cone	• Documented Sample	• Pan
scribe Surface	• Trench - do cuff checklist • Documented Sample • Single Core (HD)	• LPM (M) • Pan
scribe Surface	• Triple Core (M) • Documented Sample • Radial/diametric samples at a 10 m crater	• Pan
n scription	• Gas Sample (HD) • MSSC (HD) • Fillet Sample (HD) • Football-size rock (HD)	• LPM (HD)
	ALTERNATE PART G • Documented Sample • Pan	
	• Documented Sample	

NASA — MSC 3461-71